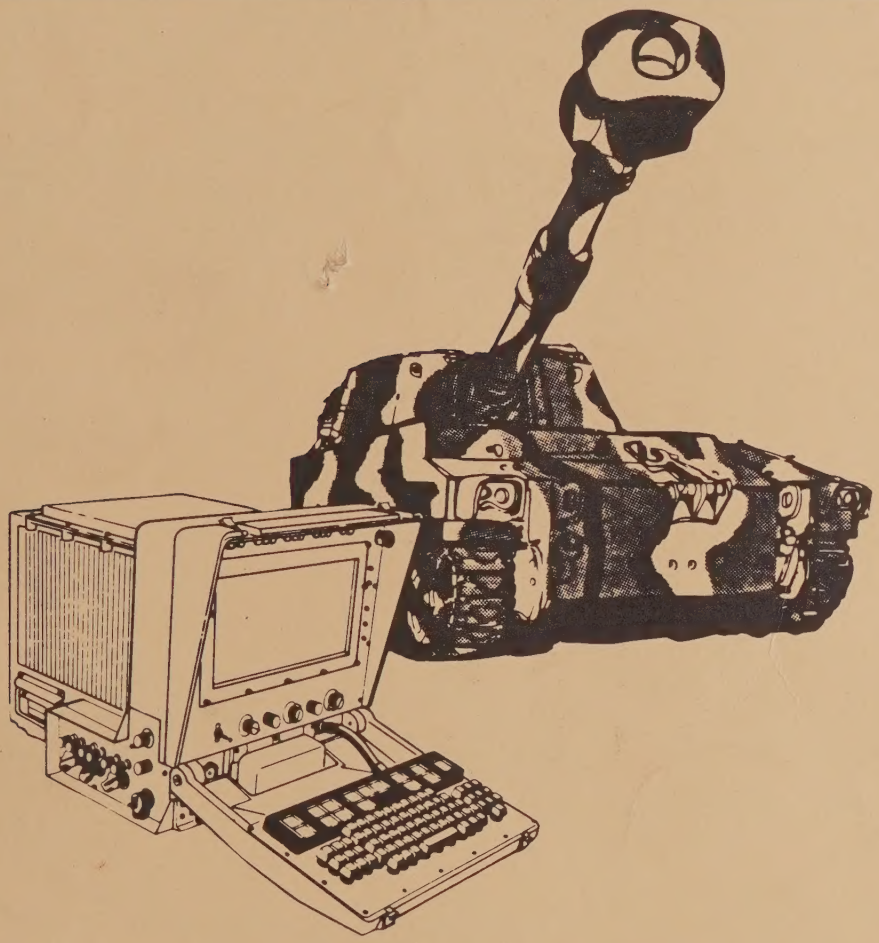
TECHNICAL MANUAL

OPERATOR'S MANUAL



CANNON

BATTERY COMPUTER SYSTEM

COMPUTER GROUP, GUN DIRECTION OL-200A/GYK-29(V)

(PART OF COMPUTER SYSTEM, GUN DIRECTION, AN/GYK-29(V))

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HEADQUARTERS, DEPARTMENT OF THE ARMY

1 FEBRUARY 1990

This manual supersedes TM 11-7440-283-12-1-1, dated 1 March 1988

5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1. DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL
2. IF POSSIBLE, TURN OFF THE ELECTRICAL POWER
3. IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A DRY WOODEN POLE OR A DRY ROPE OR SOME OTHER INSULATING MATERIAL
4. SEND FOR HELP AS SOON AS POSSIBLE
5. AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

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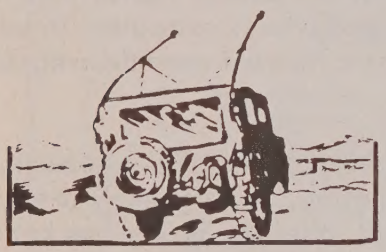
WARNING

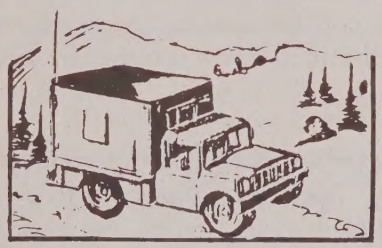
SERIOUS INJURY OR EVEN DEATH CAN HAPPEN IF THE FOLLOWING ARE NOT CAREFULLY OBSERVED WHEN INSTALLING AND USING THE ANTENNAS USED WITH YOUR RADIO SETS

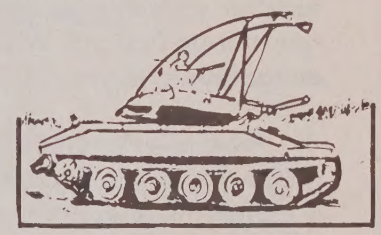
BEFORE ANY MISSION FIND OUT

1. ARE THERE ANY POWERLINES IN YOUR AREA OF OPERATION ?
2. HOW HIGH ARE THESE POWERLINES ?
3. HOW TALL ARE THE POLES OR TOWERS CARRYING POWERLINES ?

MOBILE OPERATION WITH WHIP ANTENNAS



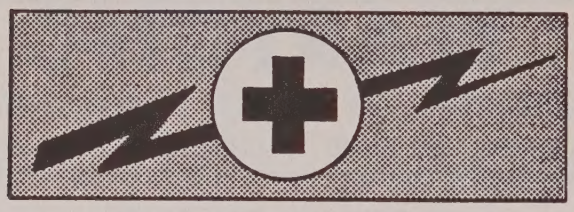




DO NOT STOP YOUR VEHICLE UNDER POWERLINES.

- IF POSSIBLE, TRY TO MAINTAIN MOBILE COMMUNICATIONS WITH YOUR ANTENNA(S) TIED DOWN.
- MAKE SURE AN ANTENNA TIP CAP IS SECURELY TAPED ON THE END OF EACH WHIP ANTENNA.
- DO NOT LEAN AGAINST OR TOUCH A WHIP ANTENNA WHILE THE TRANSMITTER IS ON.
- DURING CROSS-COUNTRY OPERATION, DO NOT ALLOW ANYONE TO STICK AN ARM, LEG OR WEAPON OVER THE SIDES OF THE VEHICLE. IF YOUR ANTENNA ACCIDENTALLY TOUCHES A POWERLINE AND A LEG, ARM OR WEAPON CONTACTS A DAMP BUSH OR THE GROUND, A SERIOUS OR FATAL ACCIDENT CAN HAPPEN.
- IF YOU ARE NOT SURE THAT AN ANTENNA ON YOUR VEHICLE WILL CLEAR A POWERLINE, STOP BEFORE YOU GET CLOSE TO THE POWERLINE AND EITHER CAREFULLY TIE DOWN THE ANTENNA OR REMOVE ANTENNA SECTIONS TO MAKE SURE THAT YOU CAN SAFELY DRIVE UNDER THE POWERLINE.

WARNING



HIGH VOLTAGE

is used in the operation of this equipment

DEATH ON CONTACT

may result if personnel fail to observe safety precautions

Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. When the technician is aided by operators, he must warn them about dangerous areas.

Whenever possible, the power supply to the equipment must be shut off before beginning work on the equipment. Take particular care to ground every capacitor likely to hold a dangerous potential. When working inside the equipment, after the power has been turned off, always ground every part before touching it.

Be careful not to contact high-voltage connections or 115 volt ac input connections when installing or operating this equipment.

Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through the body.

Warning: Do not be misled by the term "low voltage". Potentials as low as 50 volts may cause death under adverse conditions.

For Artifical Respiration, refer to FM 21-11.

WARNING

Dangerous rf voltages exist around antennas and antenna terminals during transmission. Protect yourself by knowing the safety procedures in TB SIG 291.

Do not allow the antenna to touch powerlines. Tie them down before moving.

Do not smoke or use flame when in contact with fuel or the fuel system.

TECHNICAL MANUAL

No. 11-7440-283-12-1-1-1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 1 February 1990

OPERATOR'S MANUAL

CANNON

BATTERY COMPUTER SYSTEM

COMPUTER GROUP, GUN DIRECTION OL-200A/GYK-29(V)

(PART OF COMPUTER SYSTEM, GUN DIRECTION, AN/GYK-29(V))

TAPE VERSION NUMBER 9

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-ME-PS, Fort Monmouth, New Jersey 07703-5007. A reply will be furnished to you.

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*This manual supersedes TM 11-7440-283-12-1-1, dated 1 March 1988.

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HOW TO USE THIS MANUAL

0-1. COVER

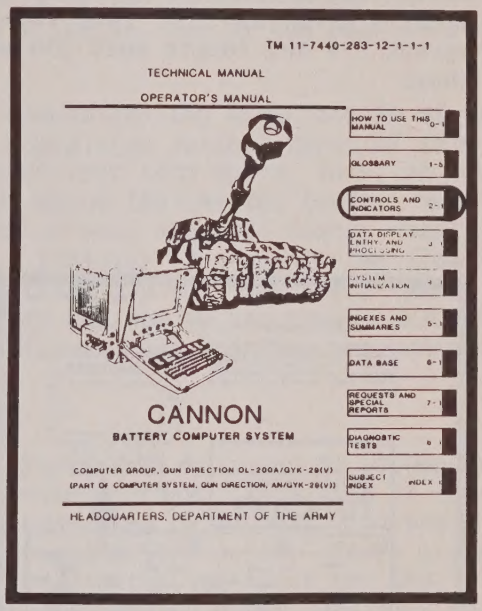
This manual is put together in a way that makes it easy for you to read and use. The front cover of each volume has an index of information and procedures you will use most often. Chapters also have indexes to help you find the subject you want. Look at the front cover and you will see black bars on the right-hand edge with the chapter titles next to them.

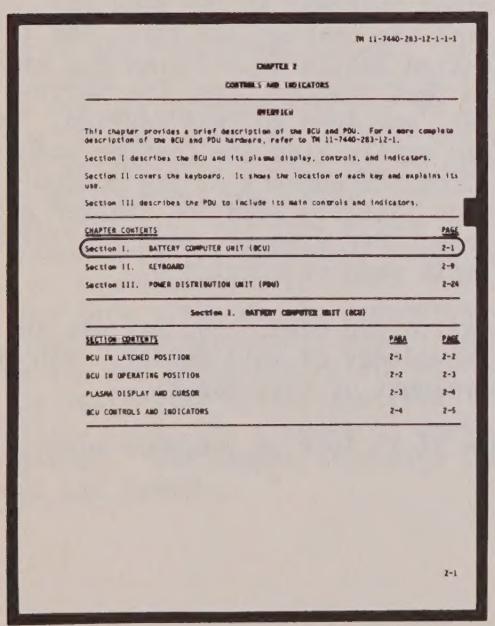
This is how it works:

a. Suppose you want to find information about the BCU controls and indicators.

b. Look at the cover pictured at the right. You will see chapter titles listed top to bottom. Find "CONTROLS AND INDICATORS."

c. Bend the pages a bit and look at the edges. You'll see black bars on some of the pages. These bars are lined up with the bars on the cover.




TM 11-7440-283-12-1-1-1

CHAPTER 2

CONTROLS AND INDICATORS

OVERVIEW

This chapter provides a brief description of the BCU and PDU. For a more complete description of the BCU and PDU hardware, refer to TM 11-7440-283-12-1.

Section I describes the BCU and its plasma display, controls, and indicators.

Section II covers the keyboard. It shows the location of each key and explains its use.

Section III describes the PDU to include its main controls and indicators.

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Section I. BATTERY COMPUTER UNIT (BCU)

SECTION CONTENTS	PARA	PAGE
BCU IN LATCHED POSITION	2-1	2-2
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PLASMA DISPLAY AND CURSOR	2-3	2-4
BCU CONTROLS AND INDICATORS	2-4	2-5

2-1

d. Put your thumbnail on the black bar that is aligned with the one on the cover for "CONTROLS AND INDICATORS."

e. You'll find the beginning of chapter 2.

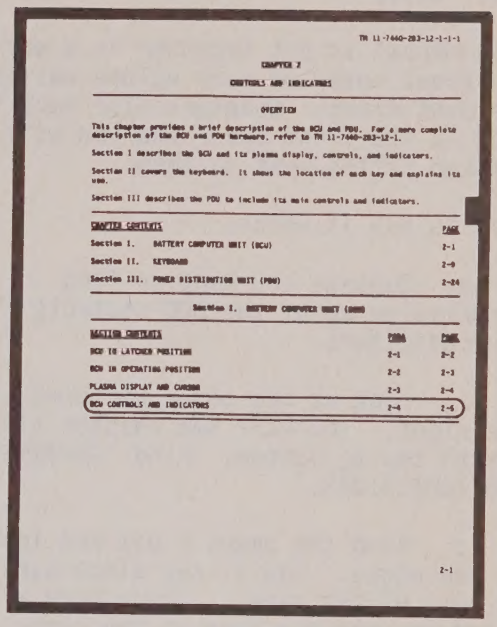
f. Under the chapter title, you'll see a list of all the sections by title and page number. This is pictured at the left.

g. Look down the list until you come to "Section I. BATTERY COMPUTER UNIT (BCU)" (outlined here with a border for illustration purposes).

O-1. COVER - CONTINUED

h. Now that you have reached the section you want, you'll see the title of each paragraph and the paragraph and page numbers.

i. Look down the list until you come to "BCU CONTROLS AND INDICATORS" and read across. The information you want is located in paragraph 2-4. Now turn to paragraph 2-4 and locate what you wanted to know.



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Section I. BATTERY COMPUTER UNIT (BCU)

SECTION CONTENTS	PARA	PAGE
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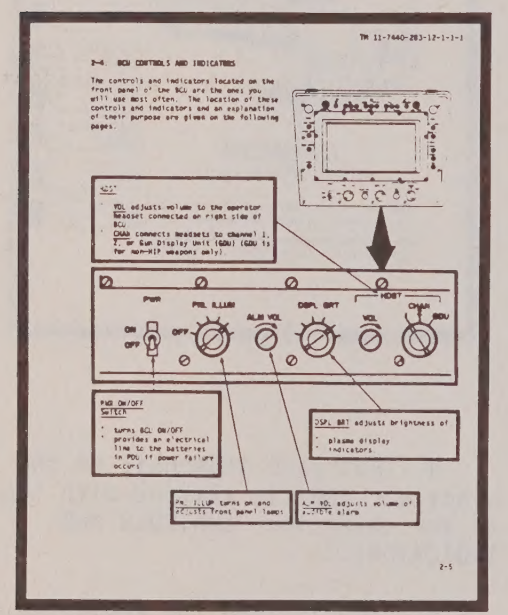
BCU IN OPERATING POSITION	2-2	2-3
PLASMA DISPLAY AND CURSOR	2-3	2-4
BCU CONTROLS AND INDICATORS	2-4	2-5

2-1



TM 11-7440-283-12-1-1-1

2-4. BCU CONTROLS AND INDICATORS

The controls and indicators located on the front panel of the BCU are the ones you will use most often. The location of these controls and indicators and an explanation of their purpose are given on the following pages.

VOL adjusts volume to the operator headset connected on right side of BCU.

CHAN connects headsets to channel 1, 2, or Gun Display Unit (GDU) (GDU is for non-HIP weapons only).

PWR

ON

OFF

PWR ON/OFF SWITCH

- turns BCU ON/OFF
- provides an electrical line to the batteries in PDU if power failure occurs

PNL ILLUM

ALM VOL

DSPL BRT

HDBT

VOL

CHAN

BDU

DSPL BRT adjusts brightness of

- plasma display
- indicators

PNL ILLUM turns on and adjusts front panel lamps

ALM VOL adjusts volume of cursor alarm

2-5

j. You can find information in other chapters in the same way. First find the chapter you think the information should be in, open the manual to that chapter, find the section number, and turn to that section. You can easily find the chapter you want since the numbers at the bottom of the page identify both the chapter and the page. For example, page 6-1 is the first page of chapter 6.

k. There are other ways to find the information you need. You may use the Table of Contents on page i in the front of both volumes of this manual. You may also use the Subject Index in the back of both volumes of this manual.

l. A glossary is located in chapter 1. Use it to look up uncommon words, phrases, and computer terms.

0-2. TM AND CHAPTER ORGANIZATION

a. TM Organization. To help you locate information, it is important for you to understand how this TM is organized. This TM is divided into two volumes. In volume 1, there is a table of contents for both volumes, chapters 0 through 8, and an index for both volumes. In volume 2, there is a table of contents for volume 2, chapters 9 and 10, appendixes A through M, and an index for both volumes. Each chapter builds on earlier ones. For example, the SYS;INDEX message is covered in chapter 5. Chapters 6 through 10 assume that you know how to use this message. Refer to the table of contents at the front of each volume of this manual to see what is covered in each chapter. It can also give you an idea of how each chapter builds on previous ones.

b. Chapter Organization. You also need to understand the organization of each chapter. Each chapter is divided into sections containing various types of information. Beginning with chapter 3, each chapter is divided into three, four, or five sections. Section I presents general information about the chapter topic. Section II presents flowcharts showing you how to perform various required tasks. Section III discusses message formats and legal entries. (Chapter 10 presents two flowchart sections in order to more clearly categorize the tasks you must perform.) Refer to paragraph 0-3 for more information about flowcharts and how to use them. Refer to paragraph 0-4 for more information about message formats and how they are presented.

0-3. FLOWCHARTS

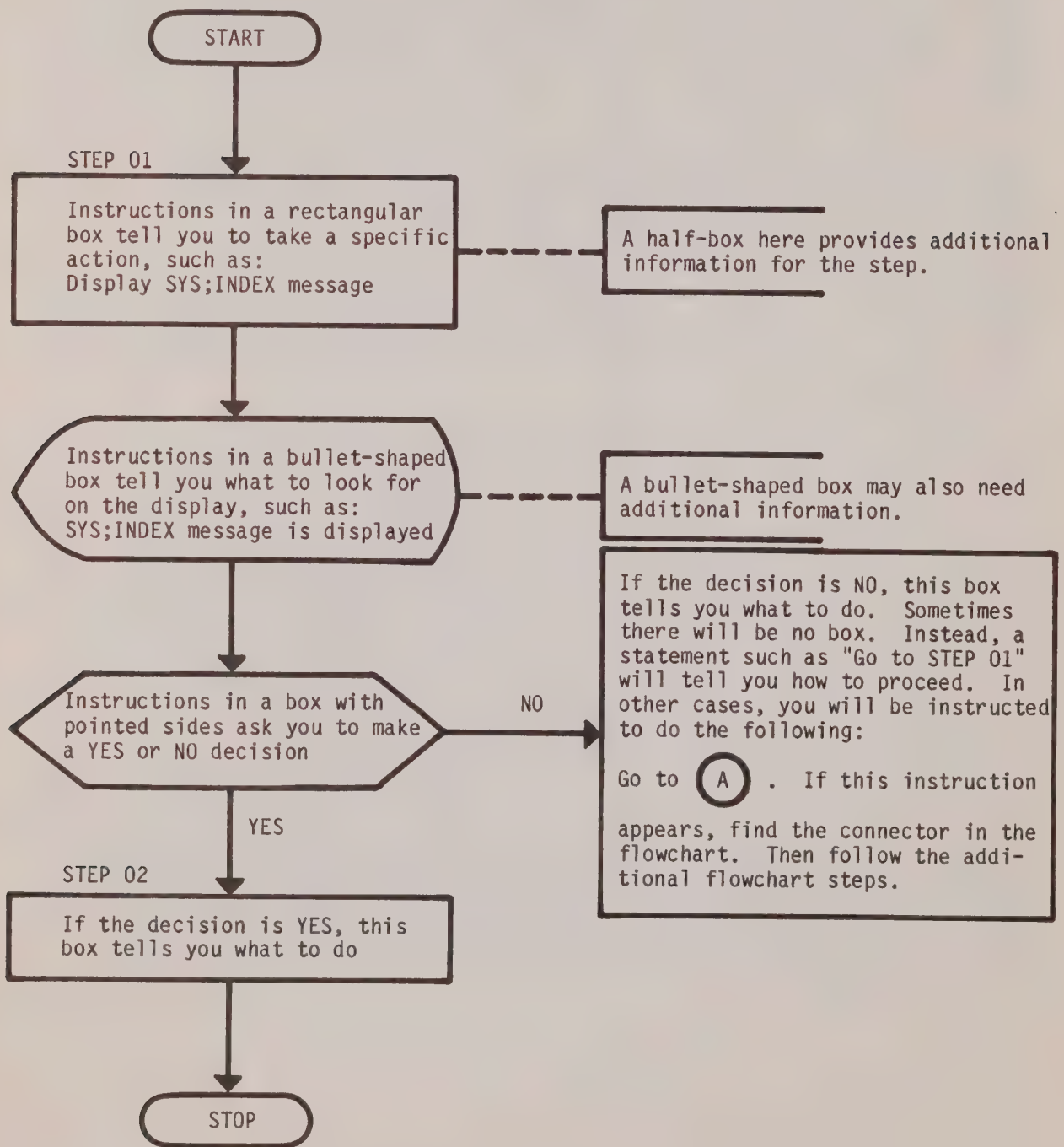
Throughout this manual you will see flowcharts. Flowcharts help you to accomplish tasks by presenting the instructions in a step-by-step format. Each step is numbered. The steps are written in boxes which are connected by arrows. You begin at the START point and complete each step until you reach a STOP point. There are also bullet-shaped boxes which indicate what is displayed on the screen of the BCU. The boxes which tell you what steps to take and the bullet-shaped boxes sometimes need additional information for clarity. Additional information is included in half-boxes in the right-hand column. These half-boxes are connected to the box or bullet by a dashed line. The flowcharts also contain boxes with pointed sides. These boxes ask you to make a YES or NO decision. Each decision block has an arrow to follow if your decision is YES, and another to follow if your decision is NO. One of the arrows will direct you to continue with the main flow of the flowchart. The other will direct you to the right-hand column of the flowchart. The right-hand column will tell you what action to take, or it will direct you to another step in the flowchart. In this way, steps in the flowchart which you might have to repeat need be represented only once. Each MOS 13E20 task is keyed to a flowchart by placing the task title at the beginning of the flowchart. Some tasks have more than one flowchart associated with them. Some flowcharts are not associated with official tasks but are presented to aid you in completing official tasks. Some flowcharts may be designated as HIP-specific. Some flowcharts may be designated as non-HIP-specific, also. The flowcharts common to both HIP and non-HIP will not be designated. The sample flowchart shown on the next page illustrates flowchart layout and symbols.

O-3. FLOWCHARTS - CONTINUED

X-XX. PARAGRAPH NUMBER AND TITLE

Use this flowchart to perform the following task:

- Task Title.


START
STEP 01
Instructions in a rectangular box tell you to take a specific action, such as:
Display SYS;INDEX message
A half-box here provides additional information for the step.
Instructions in a bullet-shaped box tell you what to look for on the display, such as:
SYS;INDEX message is displayed
A bullet-shaped box may also need additional information.
Instructions in a box with pointed sides ask you to make a YES or NO decision
NO
If the decision is NO, this box tells you what to do. Sometimes there will be no box. Instead, a statement such as "Go to STEP 01" will tell you how to proceed. In other cases, you will be instructed to do the following:
Go to (A) . If this instruction appears, find the connector in the flowchart. Then follow the additional flowchart steps.
YES
STEP 02
If the decision is YES, this box tells you what to do
STOP

O-4. MESSAGE FORMATS

An entire paragraph is devoted to the explanation of each message format. Messages may be common to the HIP and the non-HIP weapons, unique to the non-HIP weapons, or unique to the HIP weapon. The message formats which are unique to HIP or non-HIP will be labelled as HIP or non-HIP. The common message formats will not make a distinction in the title. Each paragraph contains six or seven subparagraphs depending on the message format. The seven subparagraphs include the following:

a. Purpose. This subparagraph contains a statement of the purpose of the message format.

b. Source. This subparagraph includes a list of the ways in which a message format can be displayed.

c. Input. This subparagraph discusses the data that is entered into a message format. For some multipurpose messages, this subparagraph refers you to appendix K, which contains matrixes to help you use the message. Refer to paragraph O-5 for an explanation of how to use the matrixes.

d. Computer Processing. This subparagraph explains what happens when the EXEC (execute) key, XMIT (transmit) key, or other key is pressed while a message format is on the display. In some cases, this subparagraph may be divided into HIP and non-HIP processing.

e. Output. This subparagraph describes what is displayed as a result of computer processing. In some cases, this subparagraph may be divided into HIP and non-HIP output.

f. Message Format and Legal Entries. This paragraph is designed for the low-experience user. It shows the message format as it appears on the lower display of the BCU. It includes a field-by-field explanation of how to complete the message format. The FM;QF message and a portion of the field-by-field explanation is shown as an example:

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
FM;QF;FIRE:_;FPF:_;ENDFPF:_;UPFPF:_;ASKNPT:_;
OB:__;FST:__;TGT:_____;KNPT:__;DELETE:_;CPHD:_;MIS:_;SHEAF:___;
PTF:____;SH:___/___;FZ:____/____;RDS:__/__;LOTS:_/_/_/_;CHGS:_/_;
```

FM;QF; FIRE:_;FPF:_;ENDFPF:_;UPFPF:_;ASKNPT:_;

FM;QF identifies the message as the quick response fire request message.

FM;QF; **FIRE:_;** FPF:_;ENDFPF:_;UPFPF:_;ASKNPT:_;

FIRE indicates that fire is required on a target or known point. Legal entry is an X.

O-4. MESSAGE FORMATS - CONTINUED

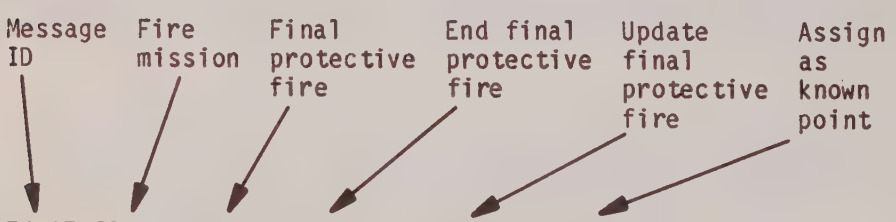
FM;QF;FIRE:_; | FPF:_; | ENDFPF:_;UPFPF:_;ASKNPT:_;

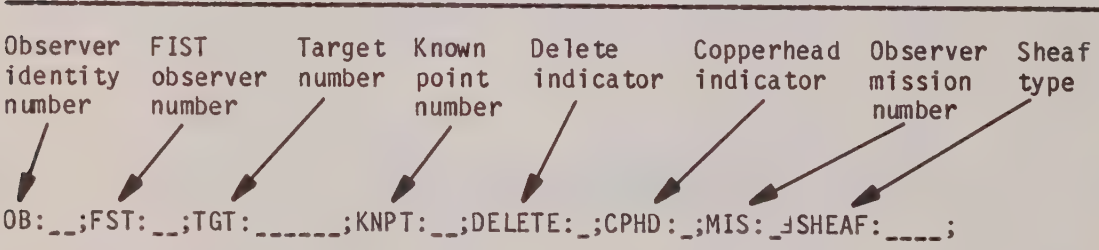
FPF indicates that the cannon FPF is being initiated. Legal entry is an X.

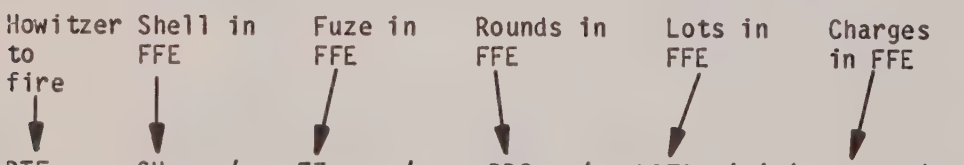
---

g. Exploded View. This subparagraph is designed for the high-experience user. It contains an exploded view of the field-by-field explanation. The exploded view provides a quick review of how to complete the message. If an exploded view of the message is not needed, subparagraph g will be listed as "Not applicable." The exploded view of the FM;QF message is shown as an example:

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
FM;QF;FIRE:_;FPF:_;ENDFPF:_;UPFPF:_;ASKNPT:_;
OB:__;FST:__;TGT:_____;KNPT:__;DELETE:_;CPHD:_;MIS:_;SHEAF:____;
PTF:____;SH:___/___;FZ:____/____;RDS:__/__;LOTS:_/_/_/_;CHGS:_/_;
```







O-4. MESSAGE FORMATS - CONTINUED

NOTE

You are allowed to make entries in some fields but not in others. If you can make entries in a field, the step-by-step explanation will tell you what the entries are by using this format: "Legal entries are _____." Sometimes the computer will generate its own entries and may not allow you to make any entries. You will still be told what these entries mean. The phrase, "Values displayed are ____," identifies a computer generated entry or an entry in a message displayed from the input queue. Also, sometimes the BCS will make an entry in a field when you leave it blank. That kind of entry is explained as follows: "Default = _____."

O-5. MATRIXES

Because some messages in the BCS are used for several functions, it is necessary for you to know which fields must contain entries for each function. For those messages, the input subparagraph (refer to paragraph O-4c) refers you to appendix K, which contains a matrix you can use to identify which fields you should complete for each function. The step-by-step instructions for completing each message (refer to paragraph O-4f) define each mnemonic and list legal entries. Use that information with the information from the matrix to properly complete the message.

Each matrix in appendix K lists all the mnemonics in the message down the left side of the matrix. Across the top of the matrix are the major functions of the message. A portion of the matrix for the FM;QF message is shown as an example.

Mnemonic	Fire on a Known Point or Recorded Target	Fire FPF	Fire CPH Priority	End FPF
FIRE	R		R	
FPF		R		
ENDFPF				R
UPFPF				
ASKNPT				
OB	O	A	A	A
FST	O	A	A	A
TGT	A		R	
KNPT	A			
DELETE				
CPHD			R	
MISS	I	I	I	I

R = required entry; A = one of these must be entered;
O = optional entry; I = for information only;
Blank = not used for this function

O-5. MATRIXES - CONTINUED

In order to use the matrix, first find the function you wish to use at the top of the matrix. Then move down the matrix and check to see which entries must be made. For instance, if you want to fire on a known point or a recorded TGT, find the column headed Fire on a Known Point or Recorded Target. Then use the legend at the bottom of the matrix to interpret the code for each mnemonic. The mnemonic FIRE has an R next to it in the column headed Fire on a Known Point or Recorded Target. This means it is a required entry for this function. TGT and KNPT both have an A next to them. This means you must make one of these entries for this function. OB and FST have an O next to them. This indicates that you may make an entry in this field, but you are not required to. MIS has an I next to it. This means that you may make an entry in this field or receive an entry in this field, but it is for information only and is not used in processing for this function. The blank boxes in the column indicate that the BCU does not use the corresponding fields in this function. You make no entries into them. Therefore, according to the matrix, in order to fire on a known point or a recorded target you must make an entry in the FIRE field. You must make an entry in either the TGT or KNPT field. You may make an entry in the OB or FST fields, but you are not required to. You should make no other entries to perform this function. Appendix K is formatted so that you may move the matrixes to the part of the manual which describes the legal entries for the corresponding message.

O-6. ERROR AND WARNING MESSAGES

When you are operating the BCS, it will display an error message if you enter incorrect information or attempt an action which is not allowed. It will display a warning message when a condition requires your attention. You must take the necessary action on the error or warning message before continuing operations. Refer to appendix E for procedures to follow to correct conditions which cause error and warning messages.

CHAPTER 1

INTRODUCTION

OVERVIEW

This chapter provides an introduction to using the Computer System, Gun Direction AN/GYK-29(V) as the Battery Computer System (BCS) for cannon.

Section I contains information about the scope of this technical manual, maintenance forms and records, and reporting equipment improvement recommendations. It also contains a nomenclature cross-reference list, abbreviation list, and a glossary.

Section II lists BCS characteristics and capabilities. It describes and illustrates the major components of the BCS. The physical dimensions and performance limits of the BCS equipment are also listed.

Section III describes the technical principles of operation, equipment interaction, and the computer program function of the BCS.

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Section I.	GENERAL INFORMATION	1-2
Section II.	EQUIPMENT DESCRIPTION	1-11
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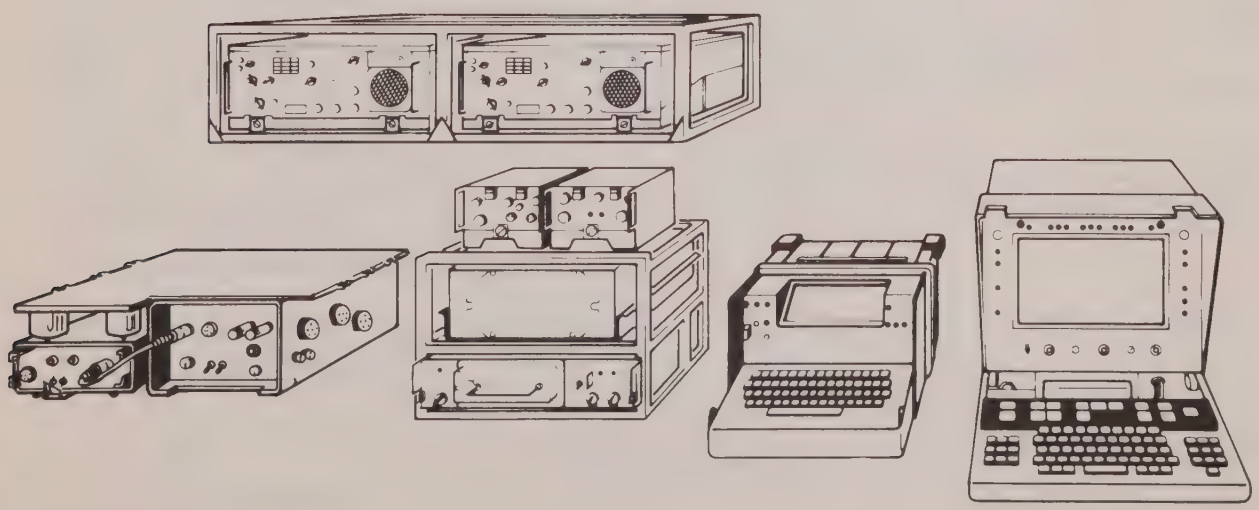

Section I. GENERAL INFORMATION

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1-1. SCOPE

This is a manual for you, the Battery Computer System (BCS) operator. It tells you how to operate the Computer System, Gun Direction AN/GYK-29(V). This computer system is the BCS for cannon. The Battery Computer Unit (BCU), Power Distribution Unit (PDU), radios, printer, and Communications Security (COMSEC) equipment make up the BCS. This system performs tactical fire direction and technical fire direction. It is also capable of controlling fire mission processing. This manual contains all the operating procedures for the BCS. This includes start up and shut down procedures. If you need more information about hardware procedures, such as assembly and maintenance, refer to the following:

EQUIPMENT	REFERENCE
BCU/PDU	TM 11-7440-283-12-1
GDU	TM 11-7440-283-12-2
AN/VRC-46 radio	TM 11-5820-401-10-1 or TM 11-5820-401-10-2
AN/PRC-68 radio	TM 11-5820-882-10
OG-174( )/VRC amplifier/power supply group	TM 11-5820-886-13
KG-31 encryption device	KAO-137D/TSEC
KY-57 encryption device	KAO-168B/TSEC

1-1. SCOPE - CONTINUED

EQUIPMENT	REFERENCE
Communications Mode Selector Control (CMSC), C-10377, Interface	TM 11-5810-316-12
Communications Terminal AN/UGC-74A(V)(3) (printer)	TM 11-5815-602-12

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS

a. Reports of Maintenance and Unsatisfactory Equipment. Department of Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, as contained in Maintenance Management Update.

b. Reporting of Item and Packaging Discrepancies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/SECNAVINST 4355.18/AFR 400-54/MCO 4430.3J.

c. Transportation Discrepancy Report (TDR) (SF 361). Fill out and forward Transportation Discrepancy Report (TDR) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

1-3. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR's)

If your BCS needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to us at: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-PA-MA-D, Fort Monmouth, New Jersey 07703-5000. We'll send you a reply.

1-4. CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS

Refer to the latest issue of DA Pam 25-30 to determine whether there are new additions, changes, or additional publications pertaining to the equipment.

1-5. DESTRUCTION OF ARMY ELECTRONICS MATERIEL

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

1-6. NOMENCLATURE CROSS-REFERENCE LIST

This paragraph gives the common name and official nomenclature of each item of BCS equipment. This manual uses common names only.

1-6. NOMENCLATURE CROSS-REFERENCE LIST - CONTINUED

COMMON NAME	OFFICIAL NOMENCLATURE
Amplifier/power supply group	Amplifier/Power Supply Group, OG-174( )/VRC
Batteries (used in PDU)	Battery, BB-590/U, Nickel Cadmium (NiCad)
BCU	Computer, Gun Direction CP-1317A/GYK-29(V)
CMSC	Communications Mode Selector Control, C-10377
KG-31	TSEC/KG-31
KY-57	TSEC/KY-57
PDU	Power Distribution Group, ON-188/GYK-29(V)
Printer	Terminal, Communications AN/UGC-74A(V)(3)
Radio	Radio Set, AN/VRC-46
Radio	Radio Set, AN/PRC-68

1-7. LIST OF ABBREVIATIONS

This paragraph lists abbreviations and acronyms used in this manual and gives their official meanings.

ABBREVIATION	OFFICIAL MEANING
ACK	Acknowledgment
AFCS	Automatic Fire Control System
ATHS	Airborne Target Handoff System
BCS	Battery Computer System
BCU	Battery Computer Unit
BIT	Built-In Test
BITE	Built-In Test (Equipment)
CEOI	Communication Electronics Operating Instruction
CESI	Communication Electronics Standing Instruction
cm	Centimeter
COMSEC	Communications Security
DMD	Digital Message Device
EIR	Equipment Improvement Recommendation
EOL	End of Orienting Line
FASCAM	Family of Scatterable Mines
FDC	Fire Direction Center
FDO	Fire Direction Officer
FIST	Fire Support Team

1-7. LIST OF ABBREVIATIONS - CONTINUED

ABBREVIATION	OFFICIAL MEANING
FLOT	Front Line of Own Troops
FM	Fire Mission
FO	Forward Observer
FSCM	Fire Support Coordination Measure
FSO	Fire Support Officer
GDU	Gun Display Unit
GLLD	Ground Laser Locator Designator
HIP	Howitzer Improvement Program
Hz	Hertz (cycles per second)
ID	Identification
INIT	Initialization
kg	Kilogram
MDS	Meteorological Data System
met	Meteorological
NAK	Negative Acknowledgment
OPORD	Operation Order
ORSTA	Orienting Station
PDU	Power Distribution Unit
PLU	Program Load Unit
RFA	Restricted Fire Area
RPV	Remotely Piloted Vehicle
SI	Sequence Index
SOP	Standing Operating Procedure
TACFIRE	Tactical Fire Direction System
TTU	Tape Transport Unit
VFMED	Variable Format Message Entry Device

1-8. GLOSSARY

Uncommon words, phrases, and computer terms are defined in this glossary.

TERM	DEFINITION
alphanumeric character	A letter of the alphabet, a number from 0 to 9, or a special character (such as a plus sign).
bit status lamps	Eleven lamps on the top front panel of the BCU that glow to indicate when a module has a fault which is detected by the built-in test equipment.
block mode	A group of data words treated as a unit.
buffer	A memory holding area for temporarily holding data until the proper device is ready to receive it.

1-8. GLOSSARY - CONTINUED

TERM	DEFINITION
central processor	That portion of a computer which contains a control unit, arithmetic unit, and storage unit. It is the heart of the computer where all data is processed.
communications security	Use of communications codes, secure voice equipment, and proper radio-telephone procedures in order to avoid disclosing operational information to the enemy.
computer memory	Location in the computer where data is stored for use at a later date.
computer-generated entry	An entry is made into a data area by the computer. The operator may make an entry into the data area if it is not protected.
conditional entry	Describes a data area where an entry is made or not made depending on the entry in another data area(s).
data	Information in a message. See digital input and manual input.
data area	The part of a field in a message format where data can be entered or changed by the operator or the computer. Some data areas are protected. Most are unprotected.
data base	The collection of data stored within the computer.
default value	An entry the computer automatically places into a field when the operator does not make an entry.
degree of protection	Describes the type of protection available to enemy personnel in a designated target area.
diagnostic tests	A series of tests that the operator can initiate which cause checks to be performed on the BCU hardware.
digital data	Data represented by binary digits (0's and 1's).
digital input	Information received in a message from another computer.

1-8. GLOSSARY - CONTINUED

TERM	DEFINITION
field	A place or location in which information is entered or displayed. Fields are the building blocks for records and contain three parts (mnemonic area, data area, and punctuation marks). See mnemonic area and data area.
field identifier	The name of a field. The field identifier is the part of the field which is the mnemonic area.
file	A group of related data records (such as a target file).
fire support coordination	The planning and executing of fire support so that targets are adequately covered by a suitable weapon or group of weapons.
fire support coordination measures	Portions of the battlefield that designate where actions may or may not be taken. They establish guidelines for firing.
flowchart	A diagram of the step-by-step procedures to be followed in performing a task.
hardware	General term applied to computer equipment and components.
high order digits	The first number in the easting coordinate and the first two numbers in the northing coordinate when long coordinates are used.
input queue	A buffer (holding area) where incoming messages are held to await processing in accordance with an established priority.
logical subscriber	The unit identification of an element that receives and transmits messages within a system.
long coordinates	A number that contains six digits for easting and at least seven for northing. (This includes high order digits.)
magnetic tape	A tape coated with magnetic material on which information can be recorded in the form of magnetic dots.
manual input	Information received by voice communications or in written form. It is entered into the computer by using the keyboard.

1-8. GLOSSARY - CONTINUED

TERM	DEFINITION
map mod	The computer function that maintains coordinates which define the general area of operations. It converts short coordinates input by the operator into long coordinates by adding high order digits. It also provides the correct grid zone and spheroid code.
mask	Data stored in the fire unit file which is used to establish a minimum altitude and quadrant elevation. This data is used to ensure that all rounds
mask	clear friendly forces and intermediate crests. The BCS can store data for up to 8 masks per howitzer or a total of 24 masks per fire unit. It provides warning messages when masks are violated.
message	A format used to send, receive, and display information.
message category	The first mnemonic area (not including the comm line) of a message with a mnemonic as a name. The message category contains a mnemonic for the first part of the message name. It is followed by a semicolon and the message type.
message segment	Section of a message. Messages which are too long to be displayed on the plasma display are divided into segments.
message skeleton	A message format containing no entries in the data areas. Used by the operator to enter data into the computer.
message type	The first mnemonic area following the message category in a message with a mnemonic name. The message type contains a mnemonic for the second part of the message name. It is almost always followed by the first field of the message format. In the case of a few messages, it is immediately followed by a data area.
mnemonic	Abbreviated form of word or group of words. It serves as a memory aid.
mnemonic area	The part of a field in a message format that contains a mnemonic (memory aid) for a field identifier. Also, the part of a message format that

1-8. GLOSSARY - CONTINUED

TERM	DEFINITION
mnemonic area (cont)	contains a mnemonic for a message category or message type.
optional entry	Describes a data area that does not require an entry by the operator for processing to take place.
prime meridian	The meridian from which longitude east and west is measured and which passes through Greenwich, England.
program	All of the coded instructions required to solve a specific problem on a computer.
program loading	Transferring the software program from the tape transport unit to the memory of the computer.
protected entry	Describes a data area where the operator cannot make an entry. Data is entered into this area by the computer. The cursor will not move to any area which is protected. All mnemonic areas and some data areas are protected. Punctuation marks are also protected.
record	A group of fields treated as a unit (such as a target record).
required entry	Describes a data area that requires an entry by the operator for processing to take place.
restricted fire area	An area in which specific restrictions are imposed. Fires that exceed those restrictions will not be delivered into the area without coordination.
short coordinates	A number that contains five digits for northing and five digits for easting. (This does not include high order digits.)
software	Computer programs, procedures, and documentation that deal with operation of the computer.
subscriber table	A list stored in the computer which identifies those subscribers that can legally send messages to your computer and receive messages from it.

1-8. GLOSSARY - CONTINUED

TERM	DEFINITION
support geometry	Control lines, boundaries, and areas used to coordinate fire and maneuver.
tactical fire direction	The selection of howitzers to fire, firing points to use, and the allocation of the most suitable ammunition for each target.
target attitude	The azimuth of the long axis of a rectangular target.
technical fire direction	The process of computing firing data necessary to fire the howitzers.
unprotected	A data area is considered to be unprotected when the operator can make an entry into that area. The cursor will move to any area which is unprotected. Most data areas are unprotected.
weapon-dependent program	The part of the software program stored on the Tape Transport Unit (TTU) which varies depending on the weapon model used. It is loaded by executing a selection from the SYS;WEAPONS message.
weapon-independent program	The part of the software program stored on the TTU which is used by the BCU no matter which weapon model is used. It is loaded by pressing the LOAD PLU button after inserting the TTU.
zone of responsibility	The area within the boundaries established for a maneuver force.
zone-to-zone transformation	The computer processing of the coordinates of a point located in a grid zone next to the grid zone stored in the computer. This process is helpful when a target is located in an adjacent grid zone.

Section II. EQUIPMENT DESCRIPTION

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LOCATION AND DESCRIPTION OF MAJOR COMPONENTS	1-10	1-12
EQUIPMENT DATA	1-11	1-18

1-9. EQUIPMENT CHARACTERISTICS AND CAPABILITIES

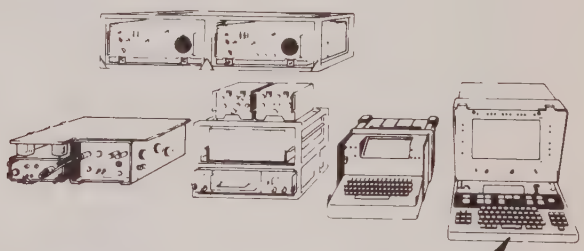
The BCU has the following characteristics and capabilities. It can:

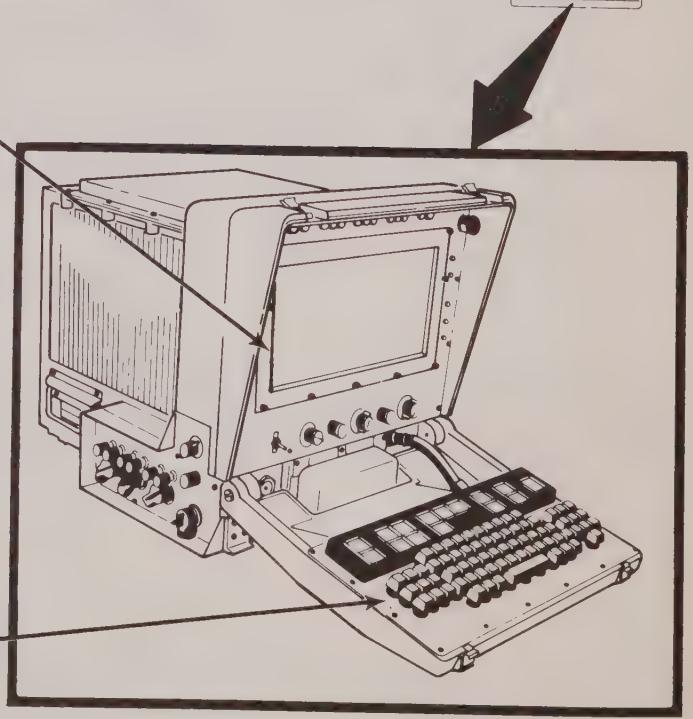
- receive, transmit, and store data
- receive data while vehicle is in motion
- accept data input from the keyboard
- communicate in either encrypted or clear modes
- relay digital messages between two other subscribers
- continue to operate properly under the following conditions:
  - when the temperature does not exceed 125°F or fall below -25°F
  - when rainfall does not exceed 9.5 inches over a 12-hour period
  - when sand and dust are driven by wind speeds of less than 30 knots
  - at altitudes up to 15,000 feet.

1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

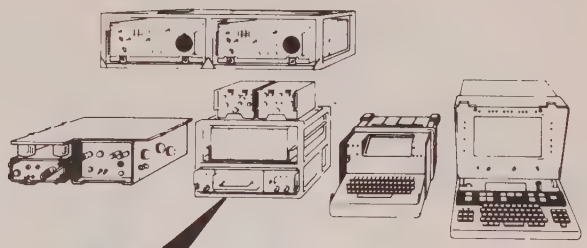
a. BCS. The BCS is made up of the BCU, PDU, and Gun Display Unit (GDU) (non-HIP weapons only), and operates with auxiliary equipment which can include a printer, radios, amplifier/power supply group, and COMSEC equipment. The following pages illustrate and describe the main pieces of equipment at the FDC. Because the GDU is not located at the FDC, it is not discussed in this TM. The BCU and PDU are described in detail in chapter 2. For a detailed description of other components at the FDC and of the GDU, refer to the TM written for each item (paragraph 1-1).

b. Battery Computer Unit (BCU). The BCU is the computer for the BCS. It receives, stores, processes, displays, and transmits information. You operate the BCU using the keyboard and controls on the front panel.

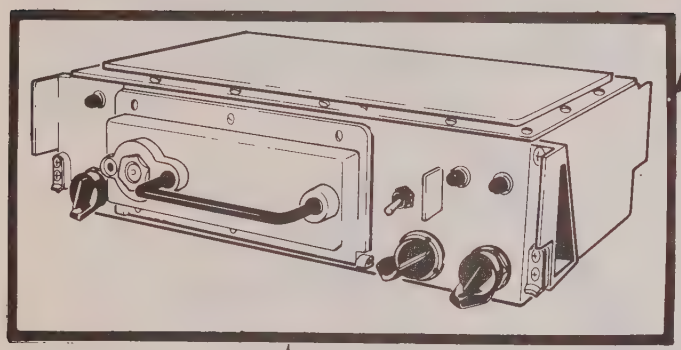



The front panel consists of:
° controls and indicators
° a plasma display to view and compose messages.
The keyboard is used to:
° enter data on the plasma display and into the data base
° remove data from the plasma display and the data base
° control the BCU.

1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - CONTINUED

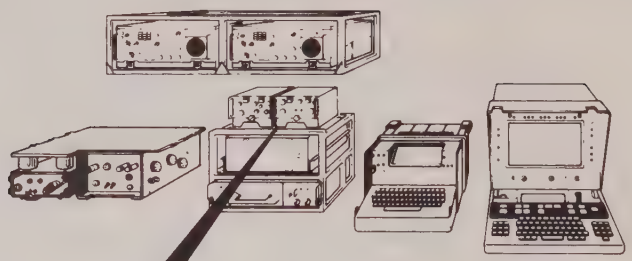


c. Power Distribution Unit (PDU)



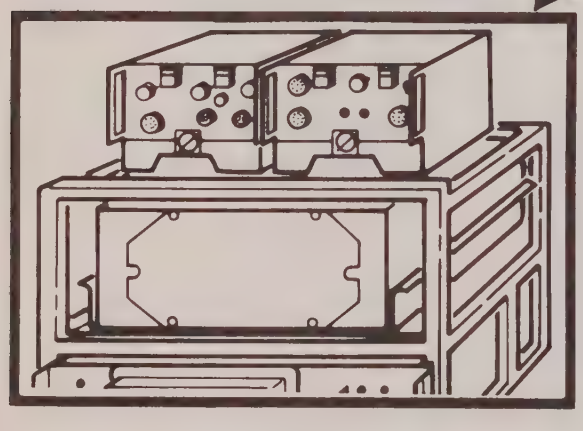
The PDU distributes and regulates external power reaching the BCS equipment. In case of power loss, batteries inside the PDU provide power to save the computer memory.

1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - CONTINUED

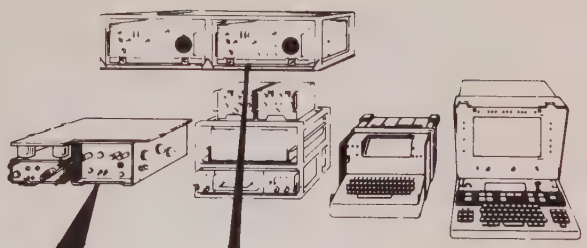


d. COMSEC Equipment

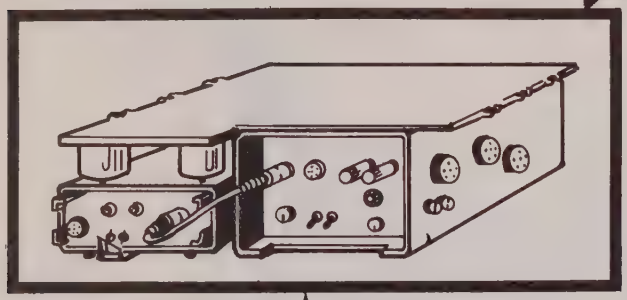
The COMSEC equipment provides encryption or decryption of either digital or voice data. The face of the KG-31 is covered by a metal plate for security reasons. You will remove this plate before operating the BCS.



1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - CONTINUED

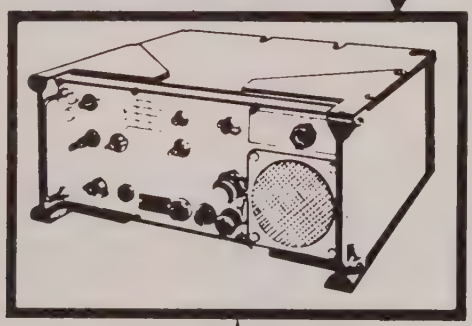


e. Radio (AN/PRC-68) and Amplifier/Power Supply Group



This radio transmits and receives either digital or voice data to and from howitzers over the GDU channel. Signals between the BCU and howitzers are routed through the amplifier/power supply group. (This radio is not used for the HIP weapon model.)

f. Radios (AN/VRC-46)

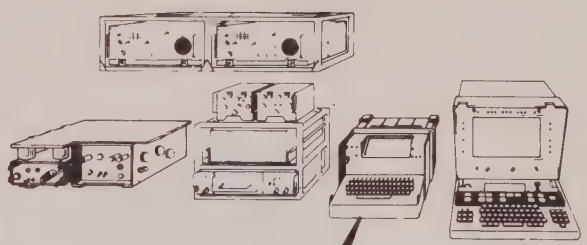


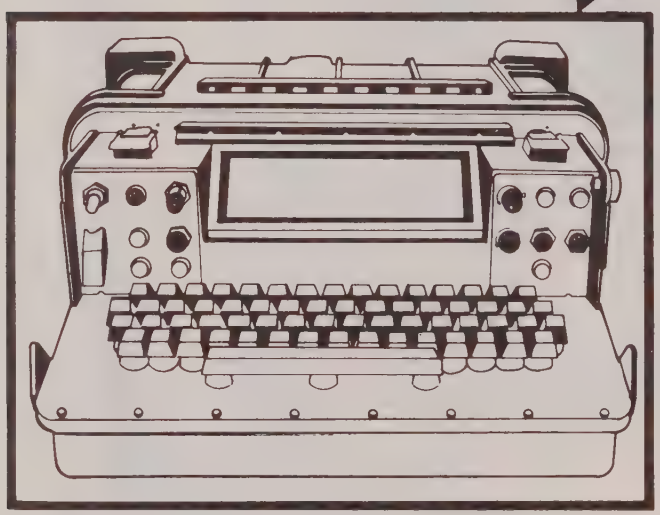
These radios transmit and receive either digital or voice data to and from subscribers over channels 1 and 2.

1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - CONTINUED

g. Printer

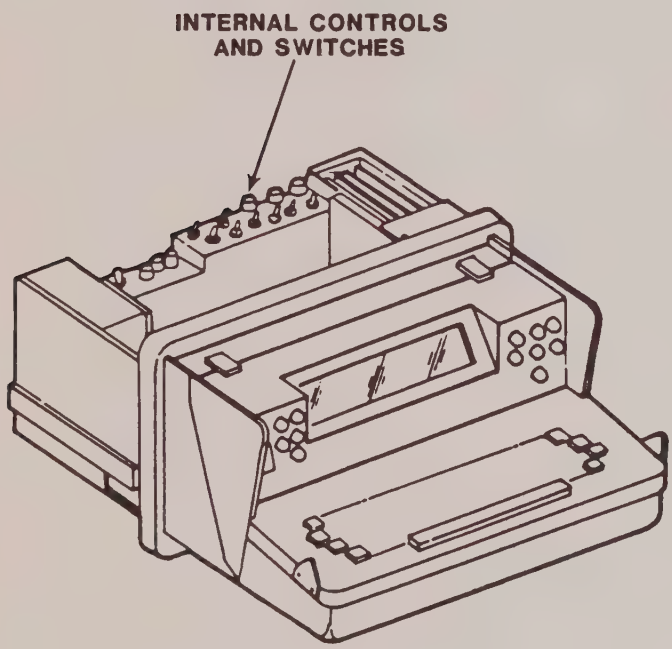
The printer can be used to print messages automatically or as selected by the operator. Either the AN/UGC-74A(V)(3) printer or a commercial printer may be used with the BCS.

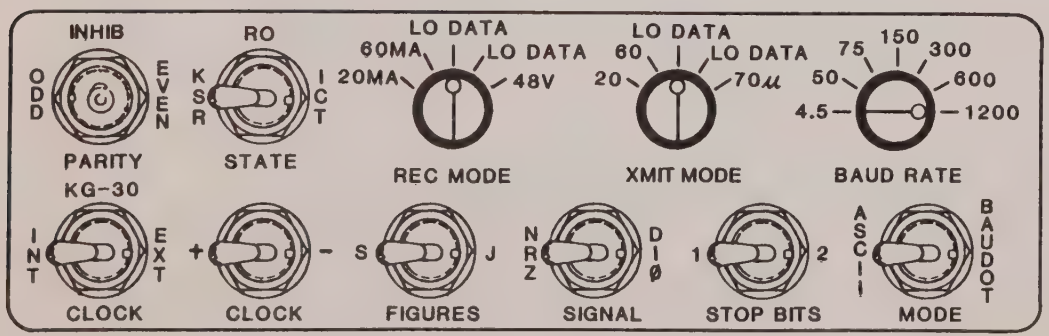




1-10. LOCATION AND DESCRIPTIONS OF MAJOR COMPONENTS - CONTINUED

There are internal controls and switches for the AN/UGC-74A(V)(3) printer that must be set before the printer is used. To reach these switches, you must remove the combination case. Refer to TM 11-5815-602-12 for more information. The location of the switches and the positions they must be set in for operation are shown below.





1-11. EQUIPMENT DATA

To understand how the BCS operates, you should know the physical dimensions and performance limits of its major components. The following provides information about the major components of the BCS:

BCU - Computer, Gun Direction CP 1317A/GYK-29(V)

- PHYSICAL

  length: 63.50 cm (25.00 in)

  width: 41.91 cm (16.50 in)

  height: 41.91 cm (16.50 in)

  weight: 48.08 kg (106.00 lb)

- ELECTRICAL

  power requirements: +20 to +35 vdc (optimum: 28 vdc) (supplied from PDU)

- EXTERNAL COMMUNICATION (channel 1 or 2)

  radio: voice and digital communications, clear or secure

  wire: secondary mode of communications

- GDU COMMUNICATION (GDU channel)

  wire: primary mode of communication

  radio: secondary mode of communication, clear

PDU - Power Distribution Group ON-188/GYK-29(V)

- PHYSICAL

  length: 33.02 cm (13.00 in)

  width: 48.26 cm (19.00 in)

  height: 13.97 cm (5.50 in)

  weight: 7.26 kg (16.00 lb)

- ELECTRICAL

  power requirements: +20 to +35 vdc (optimum: 28 vdc)

1-11. EQUIPMENT DATA - CONTINUED

° BATTERIES

BB-590/U, Nickel Cadmium (NiCad) (emergency power source for the computer memory if power fails)

NOTE

Be sure to use only B-590/U Nickel Cadmium batteries in the PDU. Do not substitute BA-5590/U Lithium Organic batteries. They are not authorized for use.

Printer - Terminal, Communications, AN/UGC-74A(V)(3)

° PHYSICAL

length: 55.25 cm (21.75 in)

width: 44.45 cm (17.5 in)

height: 24.13 cm (9.5 in)

weight: 45.36 kg (100 lb with case, cover, and paper)

° ELECTRICAL

power requirements: +22 to +30 vdc (supplied from PDU)

° CHARACTERISTICS

type: drum

print rate: 60 characters per second

printed characters: 63 gothic characters

characters per line: operator-selectable from 40 to 80 characters per line

paper type: roll paper (3-ply maximum), 5 inches in diameter by 8 1/2 inches wide

shutdown: automatic shutdown on paper outage; automatic shutdown of print drum motor if there is no printing for approximately 3 minutes

Section III. TECHNICAL PRINCIPLES OF OPERATION

SECTION CONTENTS	PARA	PAGE
GENERAL PRINCIPLES	1-12	1-20
EQUIPMENT INTERACTION	1-13	1-21
COMPUTER PROGRAM FUNCTION	1-14	1-21

1-12. GENERAL PRINCIPLES

The BCS can process both nuclear and conventional fire missions. It provides the capability for tactical fire direction and technical fire direction. Tactical fire direction is concerned with determining which howitzers are capable of firing on the target. Technical fire direction is the process of computing the technical firing data necessary to arm and fire the howitzers.

Tactical fire control is normally performed by TACFIRE. However, when the BCS operates in the autonomous mode (without TACFIRE), the BCS receives fire mission messages directly from the forward observer. The FDO must exercise tactical fire direction. He must determine if the target is feasible for attack. If not, he must determine disposition of the target. If the target is to be attacked, the FDO issues a fire order. The order informs the FDC and the BCS operator how the target will be attacked. The order includes:

- howitzers to fire
- shell/fuze/lot combination
- volume of fire.

The BCS is equipped to provide default values for this data. However, the FDO should review the fire mission message before ordering that the defaults be used.

The primary purpose of the BCS is technical fire direction. In normal operations, the BCS receives a fire mission message containing tactical fire control data for the battery from TACFIRE. Howitzers in firing areas compute their own technical solutions. The BCS will compute a technical solution using the following data for non-HIP weapons or for howitzers at firing points in HIP:

- individual howitzer locations
- individual howitzer muzzle velocity variations
- individual howitzer aimpoints
- individual howitzer ballistic trajectories
- met in use

1-12. GENERAL PRINCIPLES - CONTINUED

- registration corrections
- locations of masks for individual howitzers.

When the computation is complete, the FIRING COMMANDS are displayed on the plasma display. You transmit these commands to the howitzers by pressing the XMIT key. If the weapon model is HIP, the FM;COMNDS message will be displayed on the plasma display. This message can be automatically transmitted to the howitzers or you may be required to press the XMIT key.

1-13. EQUIPMENT INTERACTION

The BCU is the computer of the BCS. You initialize (or prepare the BCU for operation) by turning it on and loading the program into its memory. The program is what controls the BCU. In addition to the program, the computer memory stores all information needed for the BCS to fulfill its mission. This collection of information is called the data base.

The PDU distributes and regulates power to each component of the BCS. This steady flow of power is necessary to keep the equipment running properly. It also prevents data from being erased from the BCU memory. To further ensure that data is not erased, the PDU contains two batteries that save the memory during power failure.

Two standard Army FM radios (AN/VRC-46) provide communication for the BCS on channels 1 and 2. There are also two COMSEC encryption devices to provide communications security on these channels. Channels 1 and 2 can be used to communicate with the howitzers, TACFIRE, other BCS's, RPV's, MDS, ATHS, DMD's, and VFMED's. Communication with the GDU's is accomplished on the GDU channel using an FM radio (AN/PRC-68) and amplifier/power supply group. Communication on this channel is not encrypted.

1-14. COMPUTER PROGRAM FUNCTION

The brain of the BCS is the BCU. A computer does not run by itself, however. It is made up only of mechanical and electrical parts. It simply sits there using electricity until it receives instructions. These instructions, located on a magnetic tape, are called the program. They tell the computer what to do and when to do it. The instructions that make up the computer program are called the software. The term hardware, on the other hand, refers to the computer equipment. Hardware includes the keyboard, plasma display, replaceable modules, and other BCU components.

The software (or program) for the BCU is on magnetic tape inside a Tape Transport Unit (TTU) (refer to paragraph 2-1). Software is on the tape just as music is on a stereo tape cartridge. The TTU is inserted (loaded) into the Program Load Unit (PLU), which is part of the BCU. When you load the TTU into the PLU, you are putting the magnetic tape where your BCU can use it. This is the same as loading a music tape so that a stereo can use it. When you push the LOAD PLU button, the BCU transfers the information (data) on the tape into its memory. It can then be used to make the BCS operate. As with a music tape, the information remains on the tape and can be used over and over again.

CHAPTER 2

CONTROLS AND INDICATORS

OVERVIEW

This chapter provides a brief description of the BCU and PDU. For a more complete description of the BCU and PDU hardware, refer to TM 11-7440-283-12-1.

Section I describes the BCU and its plasma display, controls, and indicators.

Section II covers the keyboard. It shows the location of each key and explains its use.

Section III describes the PDU to include its main controls and indicators.

CHAPTER CONTENTS

		PAGE
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Section III.	POWER DISTRIBUTION UNIT (PDU)	2-24

Section I. BATTERY COMPUTER UNIT (BCU)

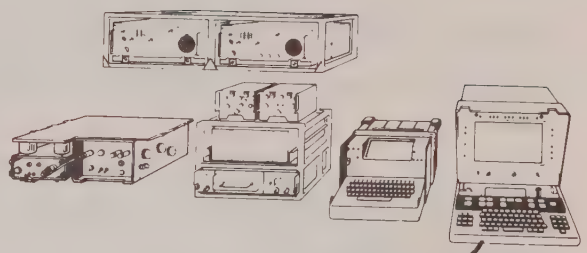
SECTION CONTENTS

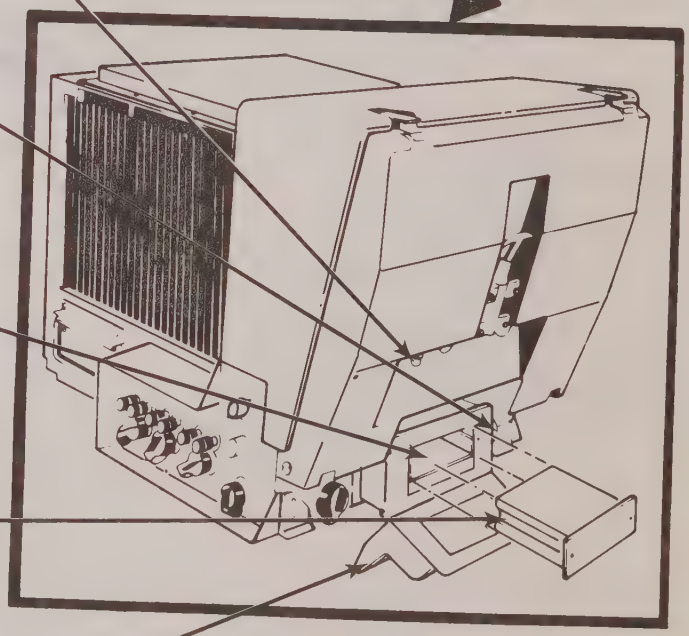
	PARA	PAGE
BCU IN LATCHED POSITION	2-1	2-2
BCU IN OPERATING POSITION	2-2	2-3
PLASMA DISPLAY AND CURSOR	2-3	2-4
BCU CONTROLS AND INDICATORS	2-4	2-5

2-1. BCU IN LATCHED POSITION

Before you can operate the BCU, you must load the program. To do this you must place the BCU in the latched position and insert the Tape Transport Unit (TTU) into the Program Load Unit (PLU). Install the tape transport cover to secure the TTU in the PLU. (Refer to TM 11-7440-283-12-1 for TTU insertion and removal instructions.)

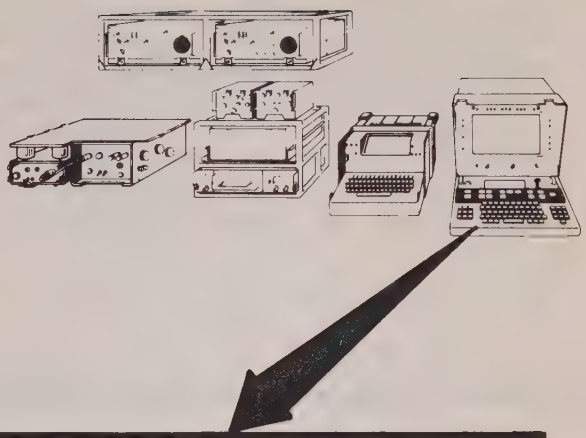
There is an external message lamp and alarm on the BCU to alert you when messages have been received. The lamp will not go out and the alarm will not stop until you place the keyboard in the normal operating position and press the ALARM ACK key.

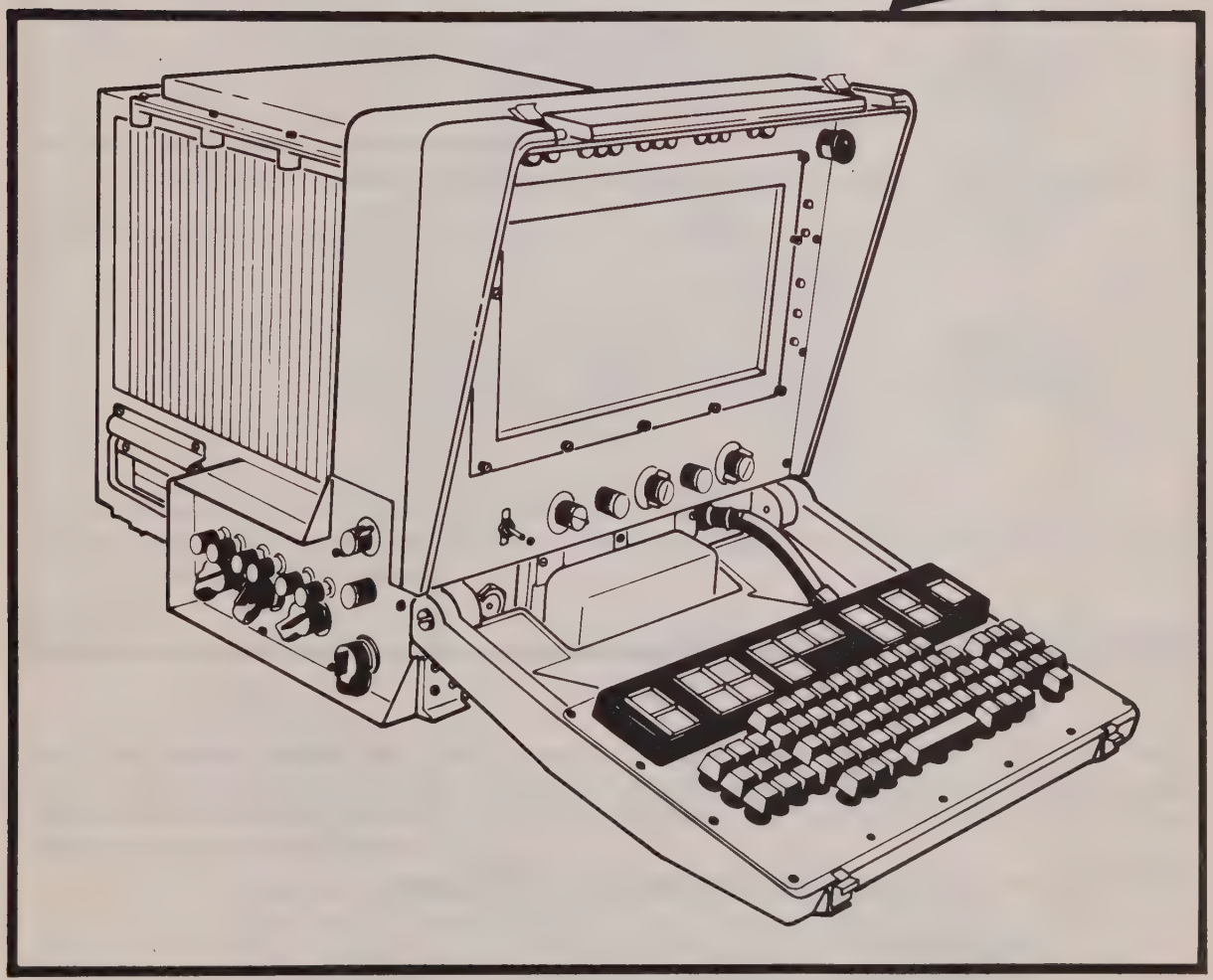



EXTERNAL MESSAGE LAMP lights when there is an incoming message.
ALARM sounds when there is an incoming message.
PROGRAM LOAD UNIT loads the program into memory.
TAPE TRANSPORT UNIT contains the program tape.
TAPE TRANSPORT COVER secures the TTU into position.

2-2. BCU IN OPERATING POSITION

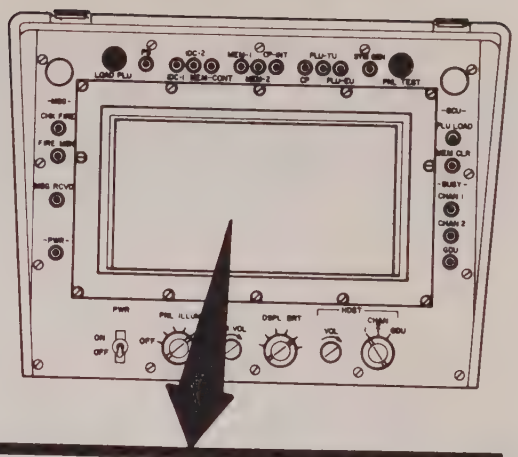
You must place the BCU in the operating position to operate normally. When the keyboard is unlatched and locked into position, you will see the plasma display, controls, indicators, and keyboard. Each of these will be discussed in the following paragraphs.

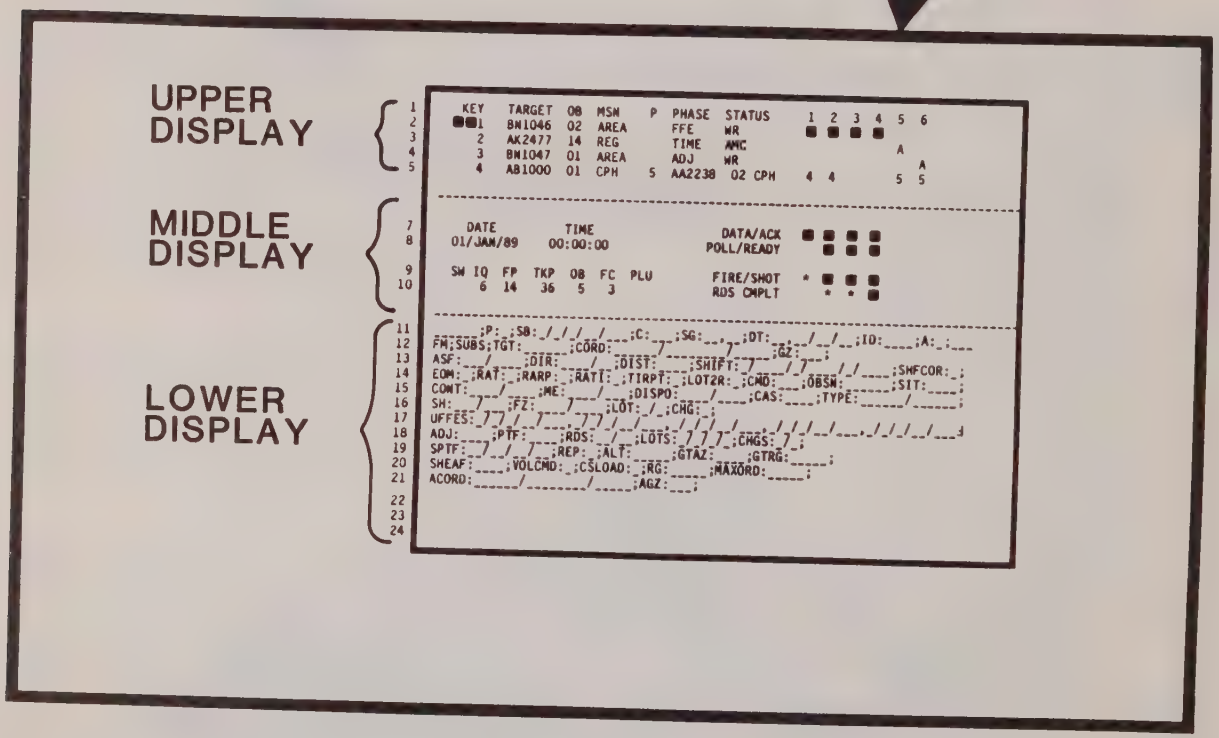




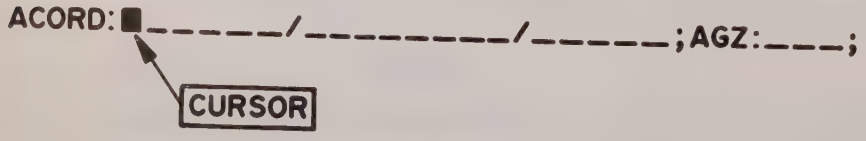
2-3. PLASMA DISPLAY AND CURSOR

a. Plasma Display. The plasma display is the screen on the front panel of the BCU. You will be focusing most of your attention on the plasma display. Below is a typical example of what you will see on the plasma display. Notice that the plasma display is divided into upper, middle, and lower displays. An explanation of the data displayed will be given in chapter 3.





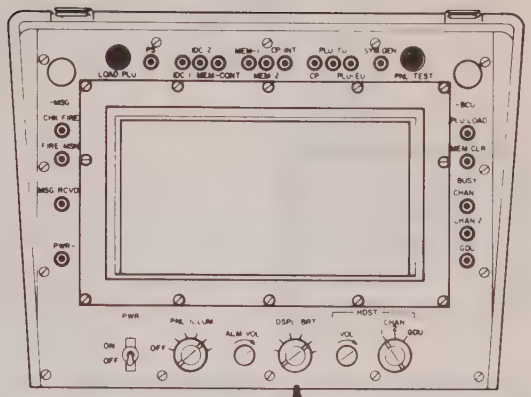
b. Cursor. The cursor is a block of orange light that moves across the lower plasma display as you press various keys. It shows where data can be typed. In the example below, the next space in which you can type is immediately following ACORD:.



The keys which control the movement of the cursor are explained in section II.

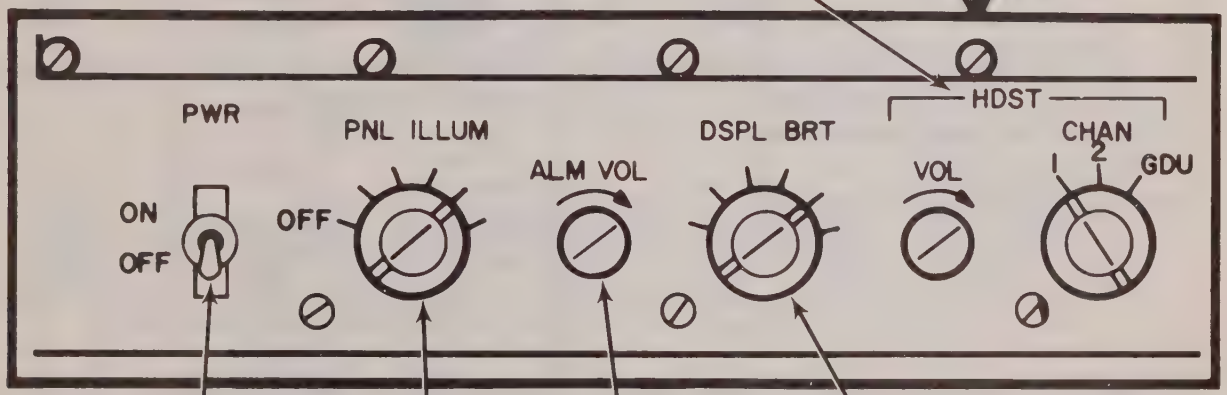
2-4. BCU CONTROLS AND INDICATORS

The controls and indicators located on the front panel of the BCU are the ones you will use most often. The location of these controls and indicators and an explanation of their purpose are given on the following pages.



HDST

- VOL adjusts volume to the operator headset connected on right side of BCU.
- CHAN connects headsets to channel 1, 2, or Gun Display Unit (GDU) (GDU is for non-HIP weapons only).



PWR ON/OFF Switch

- turns BCU ON/OFF
- provides an electrical link to the batteries in PDU if power failure occurs.

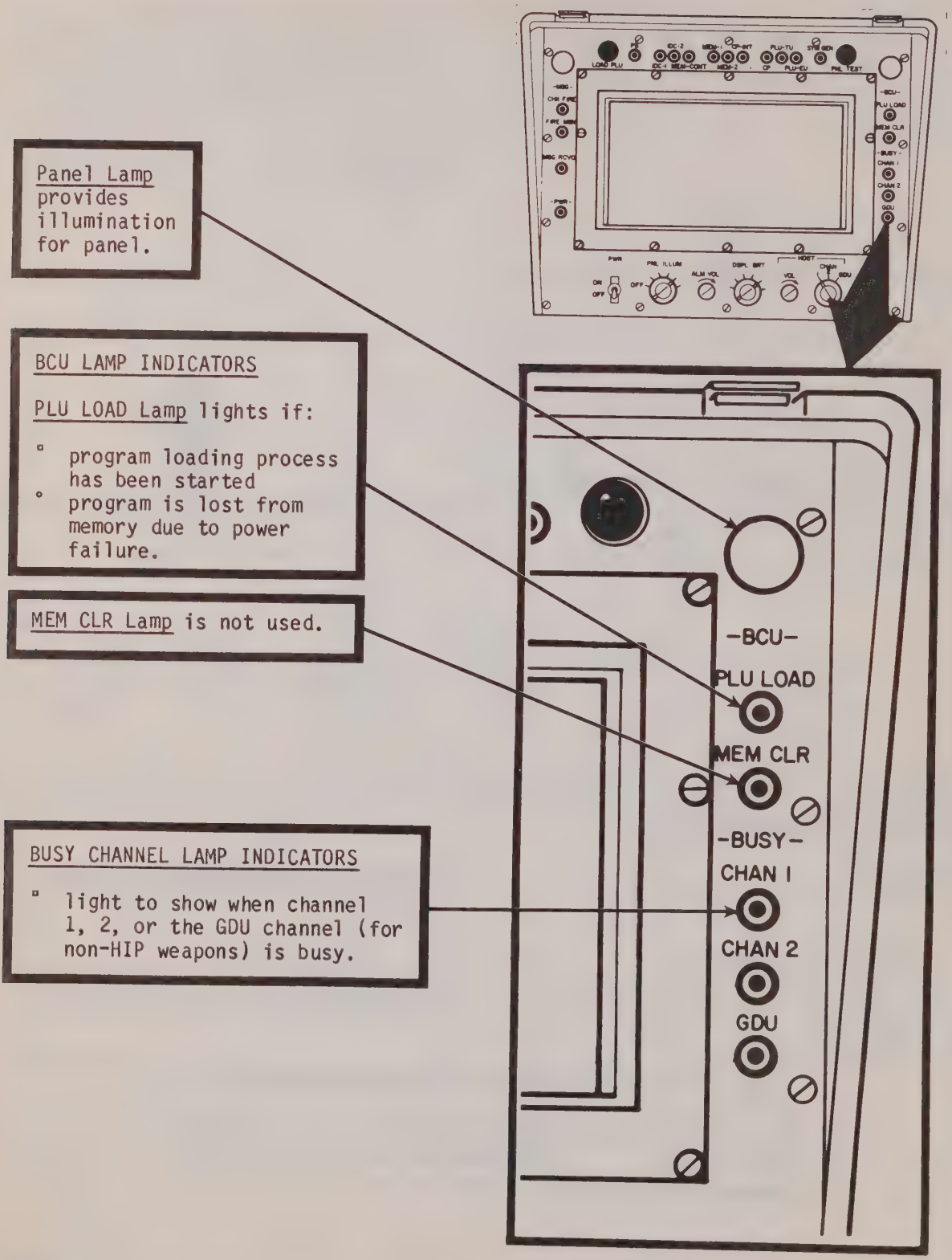
DSPL BRT adjusts brightness of:

- plasma display
- indicators.

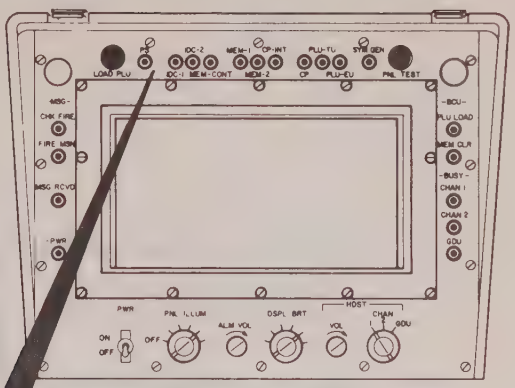
PNL ILLUM turns on and adjusts front panel lamps.

ALM VOL adjusts volume of audible alarm.

2-4. BCU CONTROLS AND INDICATORS - CONTINUED

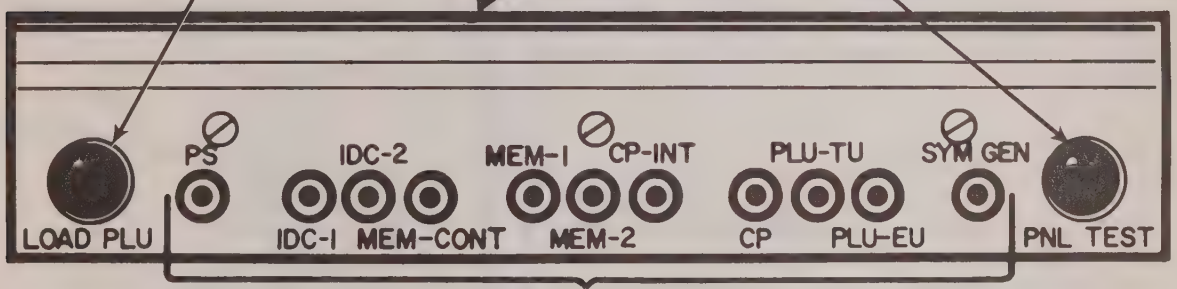

Panel Lamp provides illumination for panel.
BCU LAMP INDICATORS
PLU LOAD Lamp lights if:
program loading process has been started
program is lost from memory due to power failure.
MEM CLR Lamp is not used.
BUSY CHANNEL LAMP INDICATORS
light to show when channel 1, 2, or the GDU channel (for non-HIP weapons) is busy.
-BCU-
PLU LOAD
MEM CLR
-BUSY-
CHAN 1
CHAN 2
GDU

2-4. BCU CONTROLS AND INDICATORS - CONTINUED



LOAD PLU button is pressed to load the program into the memory of the BCS.

PNL TEST button is pressed and held to test the front panel lamps, external lamp, and audio alarm.

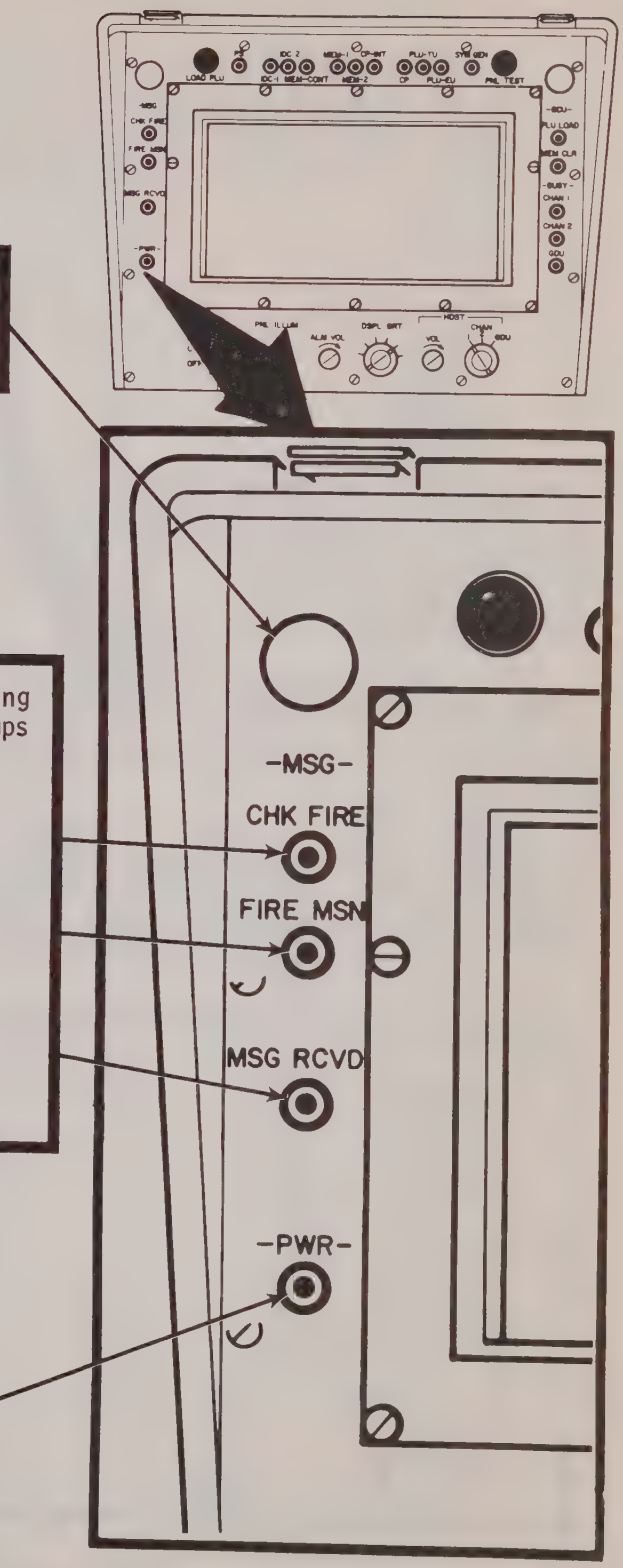


BIT Lamps

The BIT (Built-In Test) Equipment (BITE) status lamps will light if there is a fault in the module. If any BIT lamp lights, refer to TM 11-7440-283-12-1.

LAMP NAME	MODULE
PS	Low Voltage Power Supply
IDC-1	Interface Data Control 1
IDC-2	Interface Data Control 2
MEM-CONT	Memory Control
MEM-1	Memory 1
MEM-2	Memory 2
CP	Central Processor
CP INT	CP Interface
PLU-TU	PLU Tape Transport Unit
PLU-EU	PLU Electonics Unit
SYM GEN	Symbol Generator

2-4. BCU CONTROLS AND INDICATORS - CONTINUED


Panel Lamp provides illumination for the panel.
Message Indicators alert you to an incoming message. The three message indicator lamps are:
° CHK FIRE lamp which alerts you to an incoming check firing message.
° FIRE MSN lamp which alerts you to an incoming fire mission message.
° MSG RCVD lamp which alerts you to any other incoming message.
Pressing the ALARM ACK key causes these lamps to turn off.
PWR Lamp lights when BCU power is on.
-MSG-
CHK FIRE
FIRE MSN
MSG RCVD
-PWR-

Section II. KEYBOARD

SECTION CONTENTS	PAGE	PAGE
GENERAL INFORMATION	2-5	2-9
ALPHABETIC AND NUMERIC KEYS	2-6	2-10
SPECIAL CHARACTER KEYS	2-7	2-11
CURSOR CONTROL AND EDITING KEYS	2-8	2-12
SPECIAL ACTION KEYS	2-9	2-17

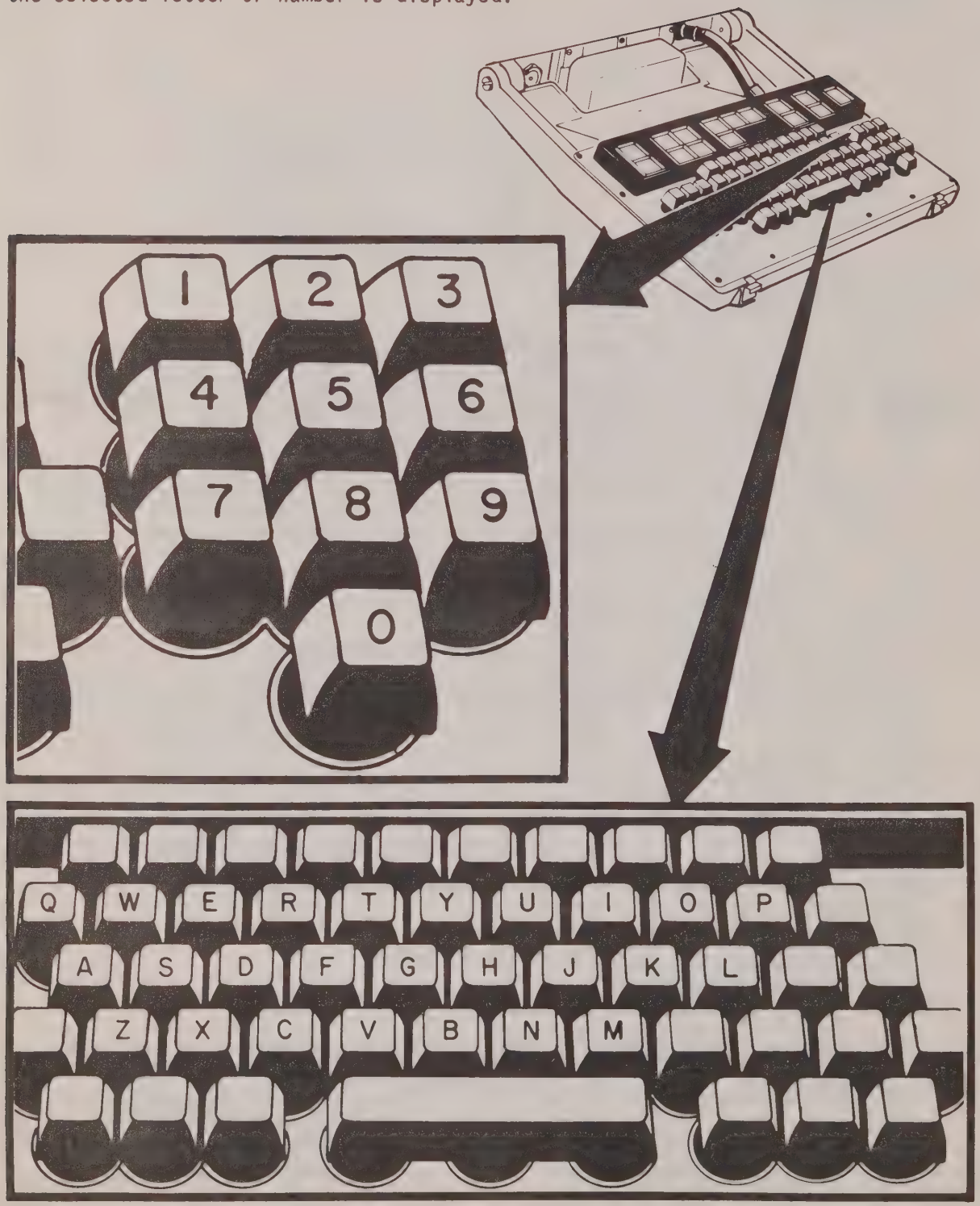
2-5. GENERAL INFORMATION

The keyboard of the BCU has all the letters, numbers, and punctuation marks found on a typewriter keyboard. It also has keys with special characters, editing keys, cursor control keys, and special action keys. The alphabetic, numeric, special character, cursor control, and editing keys will repeat automatically when pressed for more than 1 second. You use these keys to:

- turn off the alarm and MSG lamps
- display the SYS;INDEX message and other indexes, selections from the data base files, and messages received
- execute (take action on) displayed messages
- transmit check firing or cancel check firing messages
- transmit, print, save, delete, or clear messages displayed on the plasma display
- move the cursor
- insert letters, numbers, and special characters into unprotected fields of messages
- delete letters, numbers, or special characters from unprotected fields of messages
- abort computer computations on operator demand
- poll the howitzers (request gun status) (non-HIP nonly)
- transmit Final Protective Fire (FPF) and Copperhead priority firing commands
- transmit firing commands
- select one of five current fire missions for operator review.

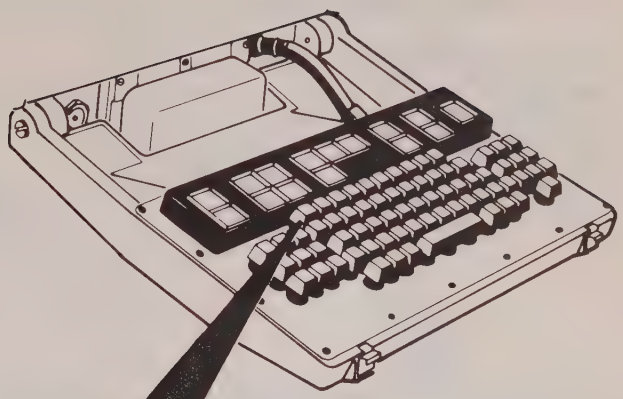
2-6. ALPHABETIC AND NUMERIC KEYS

When an alphabetic or numeric key is pressed, the selected letter or number is displayed.



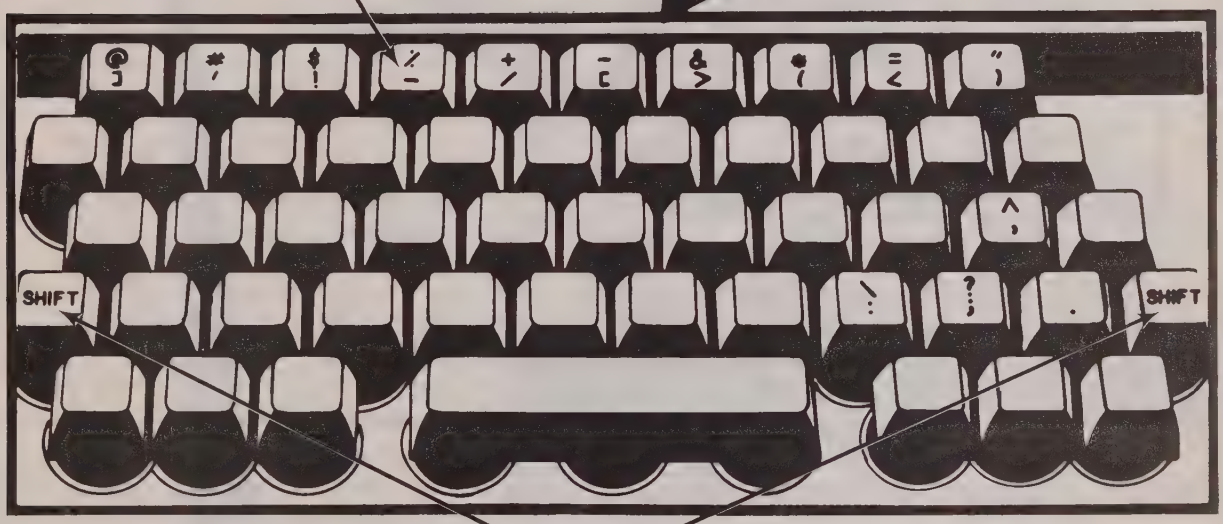
2-7. SPECIAL CHARACTER KEYS

When a special character key is pressed, the selected upper or lower character is displayed.



SPECIAL CHARACTER Keys

When a special character key is pressed, the lower character on the key is displayed.

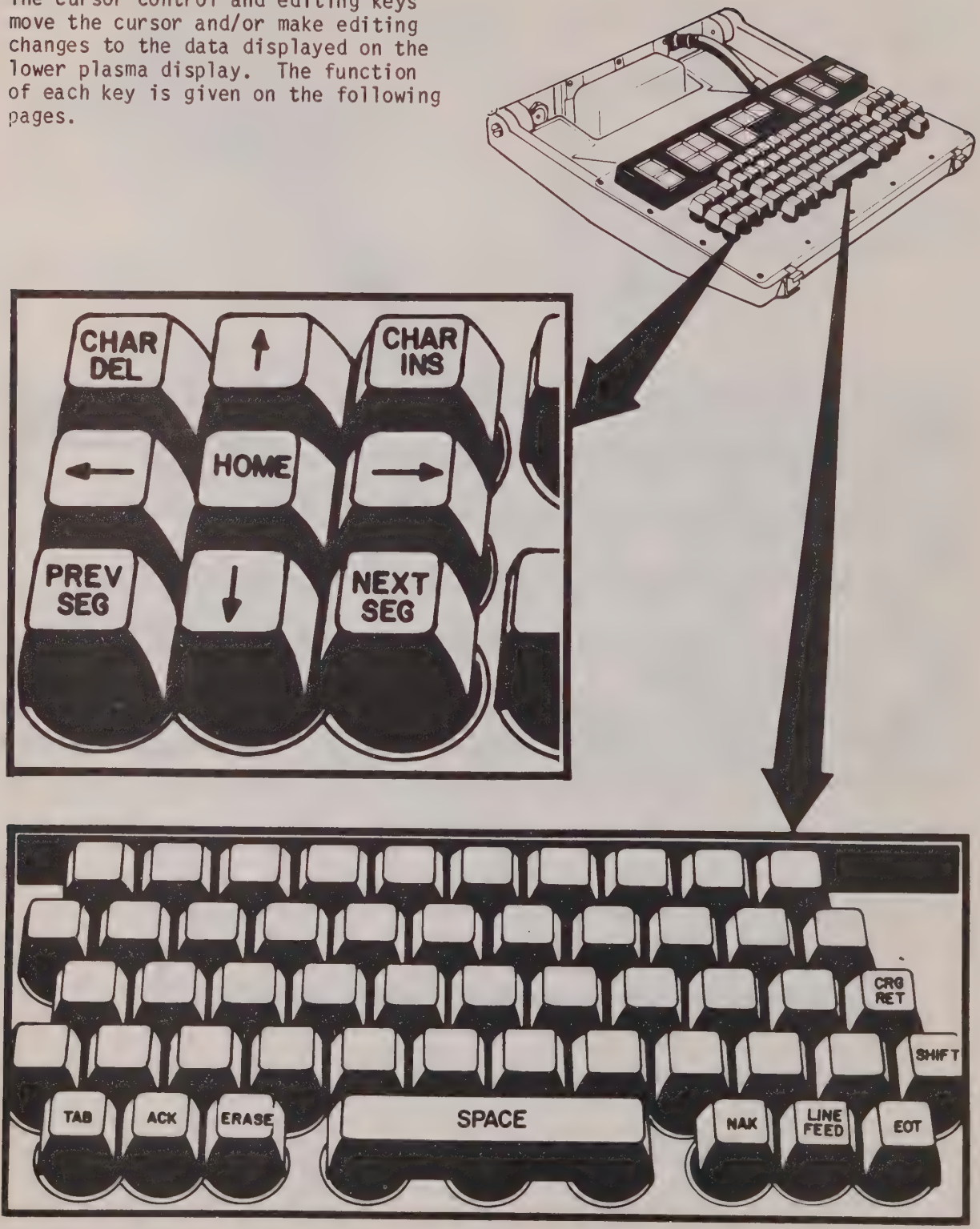


SHIFT Keys

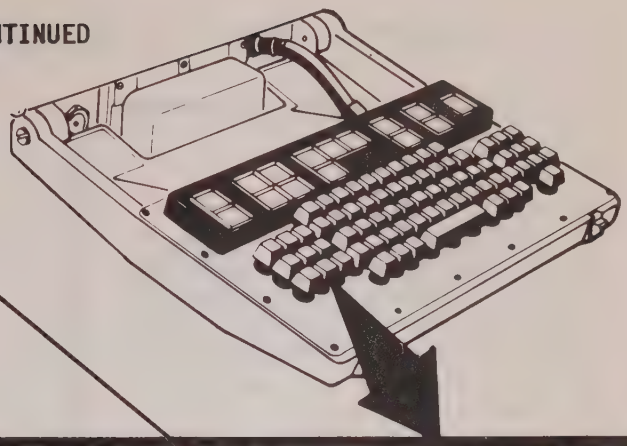
When a special character key and a SHIFT key are pressed at the same time, the upper character on the special character key is displayed.

2-8. CURSOR CONTROL AND EDITING KEYS

The cursor control and editing keys move the cursor and/or make editing changes to the data displayed on the lower plasma display. The function of each key is given on the following pages.

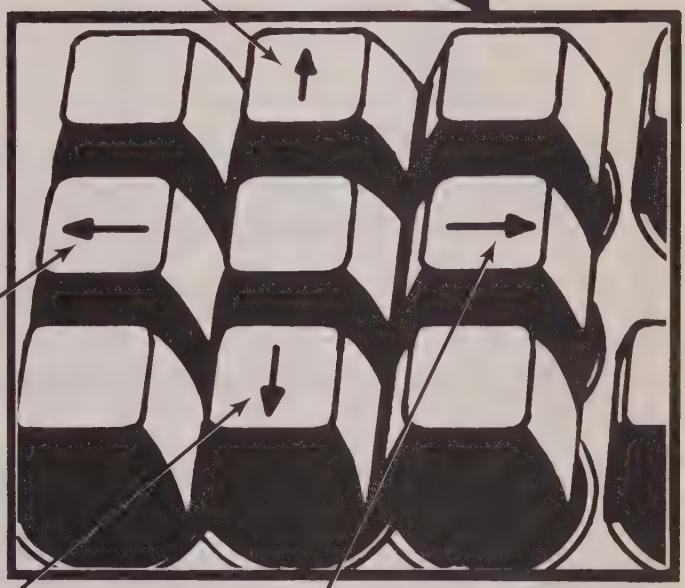


2-8. CURSOR CONTROL AND EDITING KEYS - CONTINUED



↑ KEY

When the ↑ key is pressed, the cursor moves up one line to the first unprotected position. The cursor does not move when there are no unprotected positions in the line above.



← KEY

When the ← key is pressed, the cursor moves to one of the following positions:

- to the left to the next unprotected position within a field
- to the left over a protected field to the next unprotected position
- to the last unprotected position in the line above when the cursor is in the first unprotected position of a line.

↓ KEY

When the ↓ key is pressed, the cursor moves to one of the following positions:

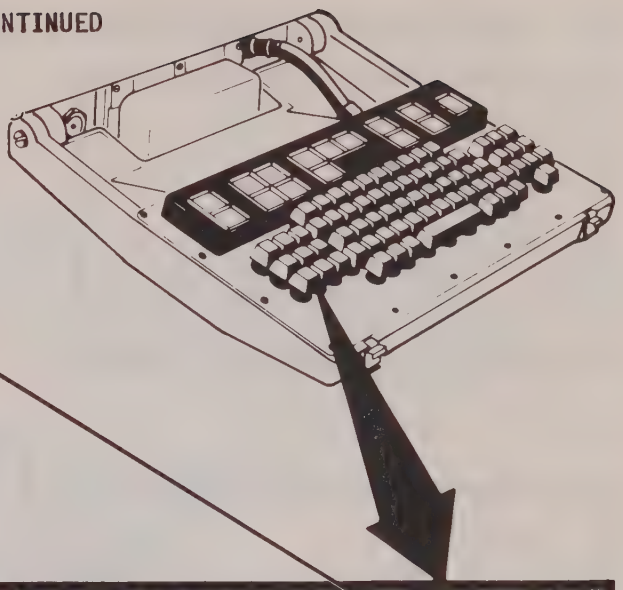
- down one line to the first unprotected position in the line below
- to the HOME position when the cursor is in any unprotected position of the last line.

→ KEY

When the → key is pressed, the cursor moves to one of the following positions:

- one space to the right to the next unprotected position within a field
- to the right over a protected field to the next unprotected position
- to the first unprotected position on the line below when the cursor is in the last unprotected position of a line
- to the HOME position when the cursor is in the last unprotected position of the bottom line.

2-8. CURSOR CONTROL AND EDITING KEYS - CONTINUED



CHAR INS Key

When the CHAR INS (character insert) key is pressed, the cursor does not move. The character outlined by the cursor and all characters to the right of the cursor in the same field or subfield move one space to the right. The character that is in the last unprotected position in a field or subfield is deleted. A blank space is put in the character position outlined by the cursor.

CHAR DEL Key

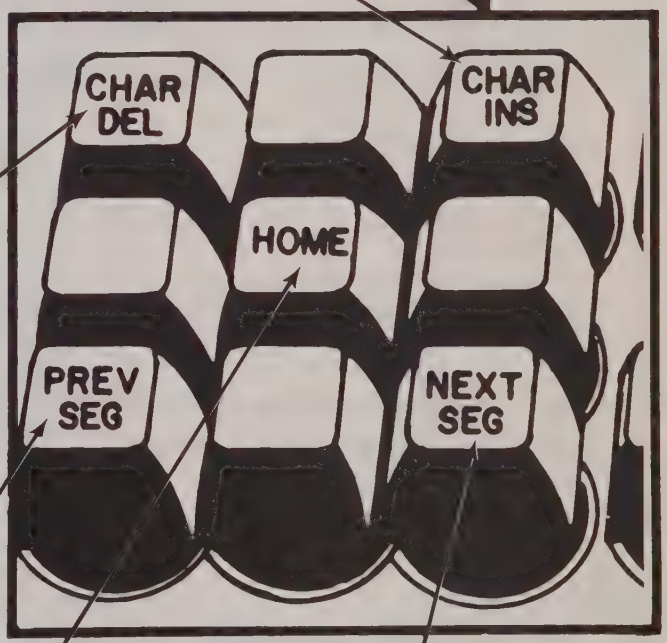
When the CHAR DEL (character delete) key is pressed, the character outlined by the cursor is deleted. The cursor does not move. All characters to the right of the cursor within a field or subfield move one position to the left. A blank space is created at the right end of the field or subfield.

PREV SEG Key

When the PREV SEG key is pressed, the previous message in a cycle of messages, the previous segment of a multisegment message, or a page of associated error and warning messages is displayed.

HOME Key

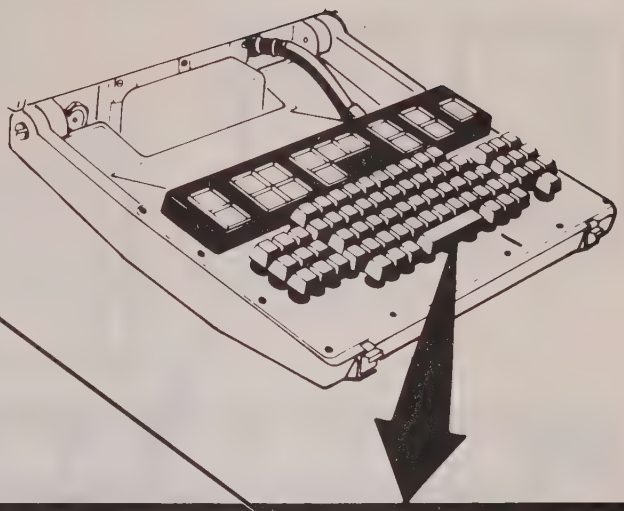
When the HOME key is pressed, the cursor moves to the HOME position. The HOME position is the first unprotected position in the top line of the lower display.

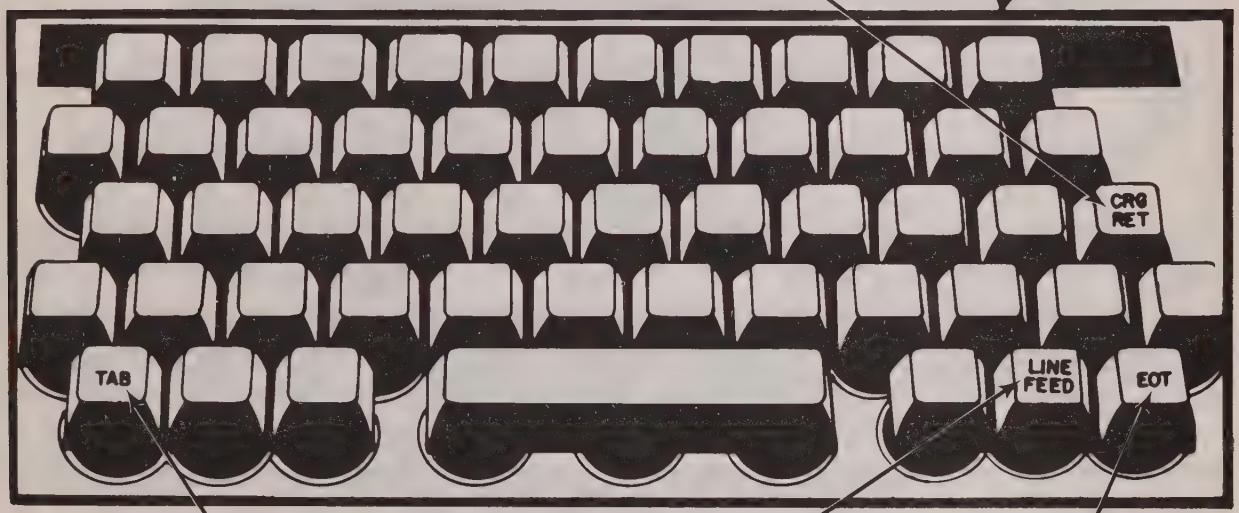


NEXT SEG Key

When the NEXT SEG key is pressed, the next message in a cycle of messages, the next segment of a multisegment message, or a page of associated error and warning messages is displayed.

2-8. CURSOR CONTROL AND EDITING KEYS - CONTINUED





CRG RET Key

When the CRG RET (carriage return) key is pressed, the cursor moves to the first unprotected position of the line below. The CRG RET key will not move the cursor when the cursor is on the bottom line or the first unprotected position of a line.

TAB Key

When the TAB key is pressed, the cursor moves to one of the following positions:

- to the right to the first unprotected position of the next field or subfield
- to the first unprotected position on the next line
- to the HOME position when it is in the last unprotected field of the bottom line.

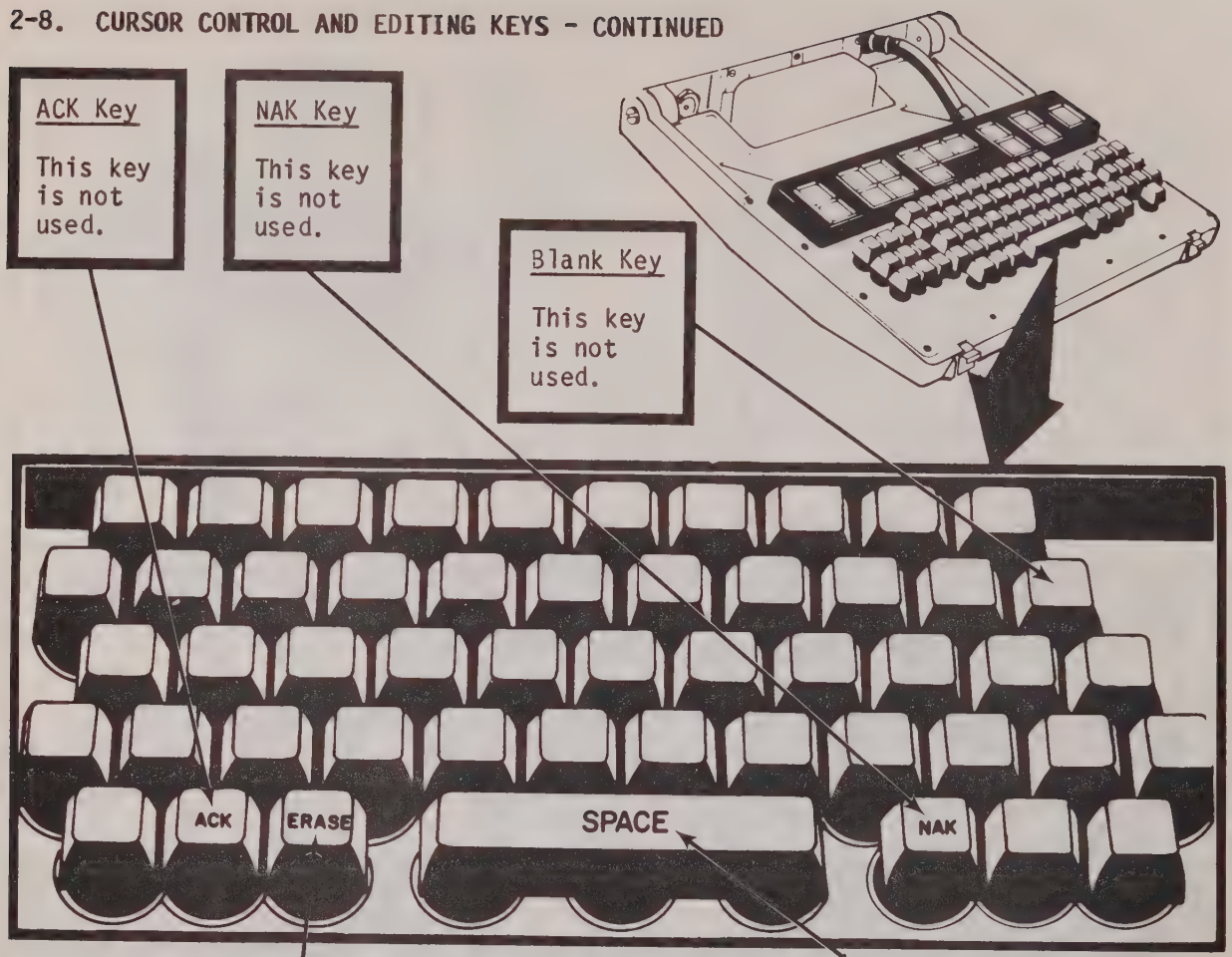
LINE FEED Key

When the LINE FEED key is pressed, the cursor moves down one line directly below the previous cursor position. If the cursor position is protected, the cursor moves to the left to the first unprotected position. When the cursor is on the bottom line, pressing the LINE FEED key causes the cursor to move to the HOME position.

EOT Key

When the EOT key is pressed, the end of transmission character (ㅓ) is displayed.

2-8. CURSOR CONTROL AND EDITING KEYS - CONTINUED



ERASE Key

When the ERASE key is pressed, the character under the cursor is erased and the cursor moves to one of the following positions:

- to the right to the first unprotected position within a field
- over a protected field to the first unprotected position
- to the first unprotected character position on the next line when the cursor is in the last character position.

When the cursor is in the last unprotected position of the bottom line, the character is erased but the cursor will not move.

SPACE Bar

When the SPACE bar is pressed, the cursor moves to one of the following positions:

- one space to the right to the next unprotected position within a field
- to the right over a protected field to the next unprotected position
- to the first unprotected position on the line below when the cursor is in the last unprotected position of a line
- to the HOME position when the cursor is in the last unprotected position of the bottom line.

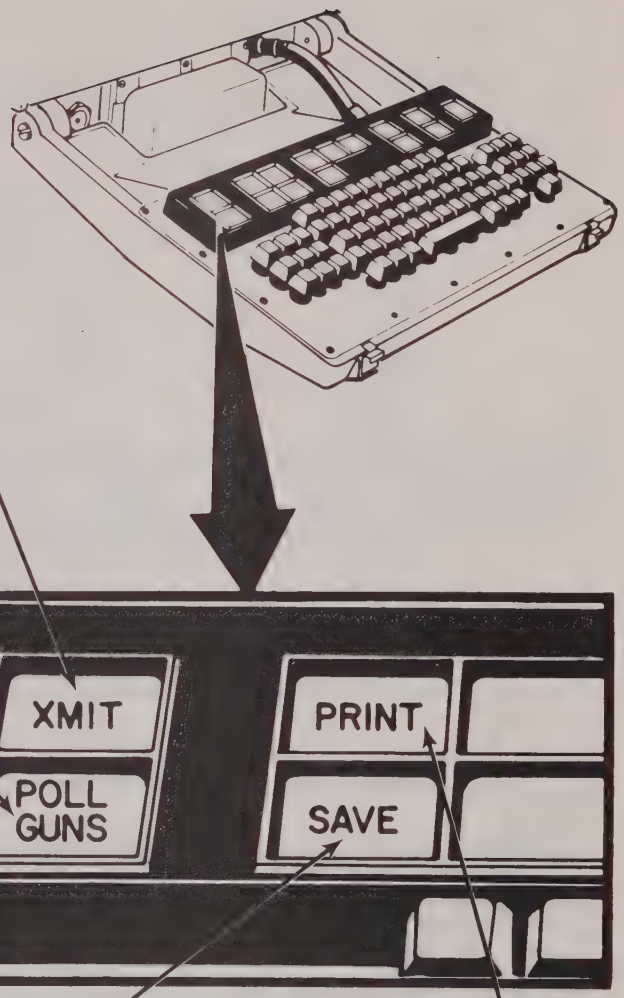
2-9. SPECIAL ACTION KEYS

The special action keys control the action the computer takes on the displayed data. An explanation of what each key does is given on the following pages.

% Key

The percent sign (%) is a special character on the keyboard. But the computer also uses this key to perform a special action. When the percent (%) key and SHIFT key are pressed, ballistic computation is aborted. The word ABORTED is displayed in the STATUS column of current mission buffers 1, 2, and 3. When a registration update is aborted, the SYS;INDEX message is displayed. The mission data message is displayed on the lower display when fire missions are aborted during ballistics.

2-9. SPECIAL ACTION KEYS - CONTINUED



XMIT Key

When the XMIT (transmit) key is pressed, the message is transmitted.

POLL GUNS Key

The POLL GUNS key is not used with the HIP weapon model. For non-HIP weapons, if manual polling has been selected and a mission is in the current mission buffer(s), when the POLL GUNS key is pressed:

- a message requesting howitzer status is transmitted to the howitzers assigned to the current mission
- an asterisk is displayed on the POLL/READY line of the middle display for the howitzers assigned to the current mission.

SAVE Key

When the SAVE key is pressed:

- the displayed message is stored (If the message was from the input queue, it will also stay in the input queue.)
- the message in storage (if any is displayed
- the SYS;INDEX message is displayed if there is no message in storage.

When the SAVE key is pressed again, the original message is displayed.

PRINT Key

When the PRINT key is pressed and a printer is connected and online, the following may be printed:

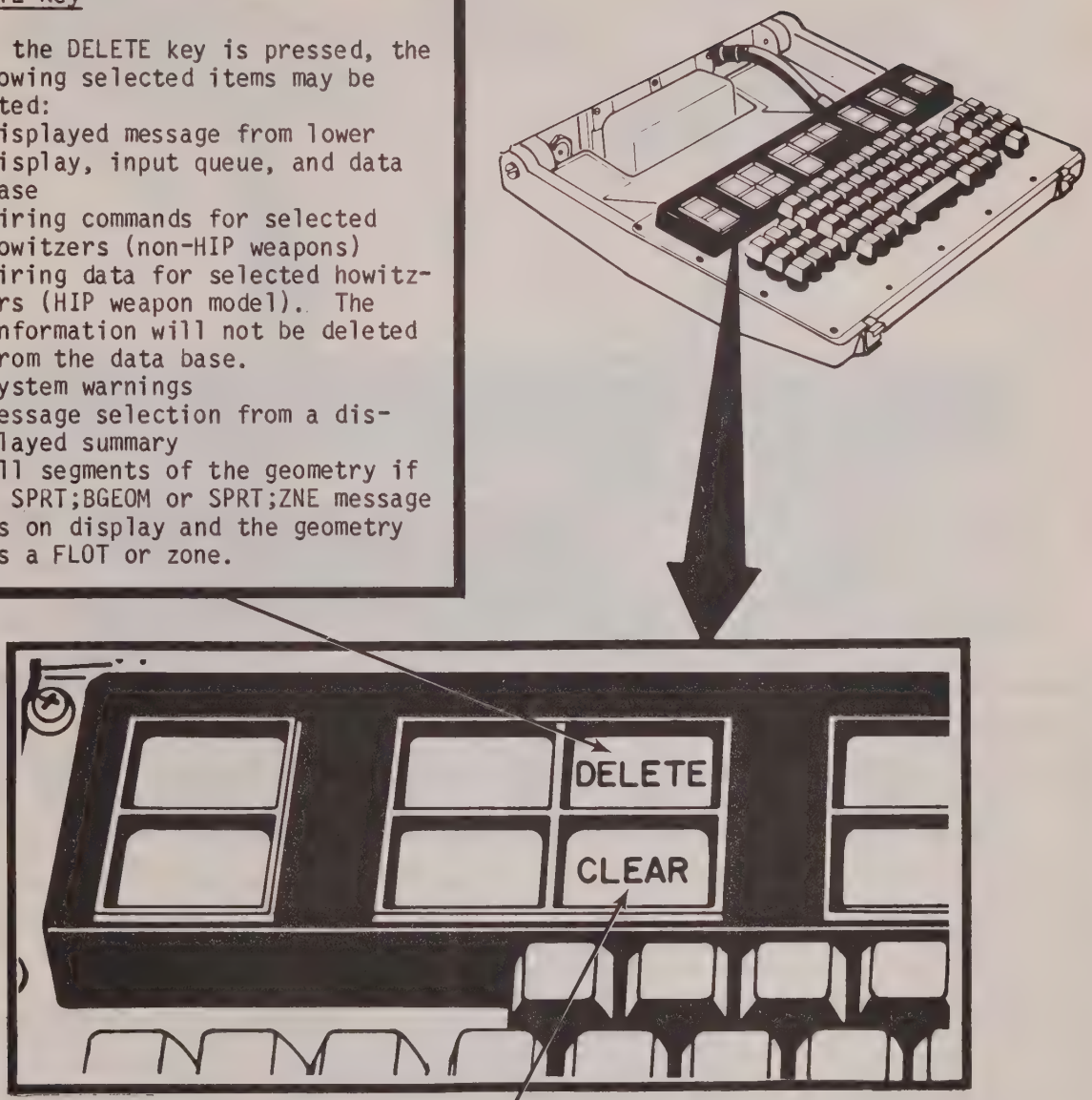
- the lower 14 lines of plasma display if SCREEN field of SYS;SETUP message is blank
- the entire plasma display if SCREEN field of SYS;SETUP message has entry of X.

2-9. SPECIAL ACTION KEYS - CONTINUED

DELETE Key

When the DELETE key is pressed, the following selected items may be deleted:

- displayed message from lower display, input queue, and data base
- firing commands for selected howitzers (non-HIP weapons)
- firing data for selected howitzers (HIP weapon model). The information will not be deleted from the data base.
- system warnings
- message selection from a displayed summary
- all segments of the geometry if a SPRT;BGEOM or SPRT;ZNE message is on display and the geometry is a FLOT or zone.

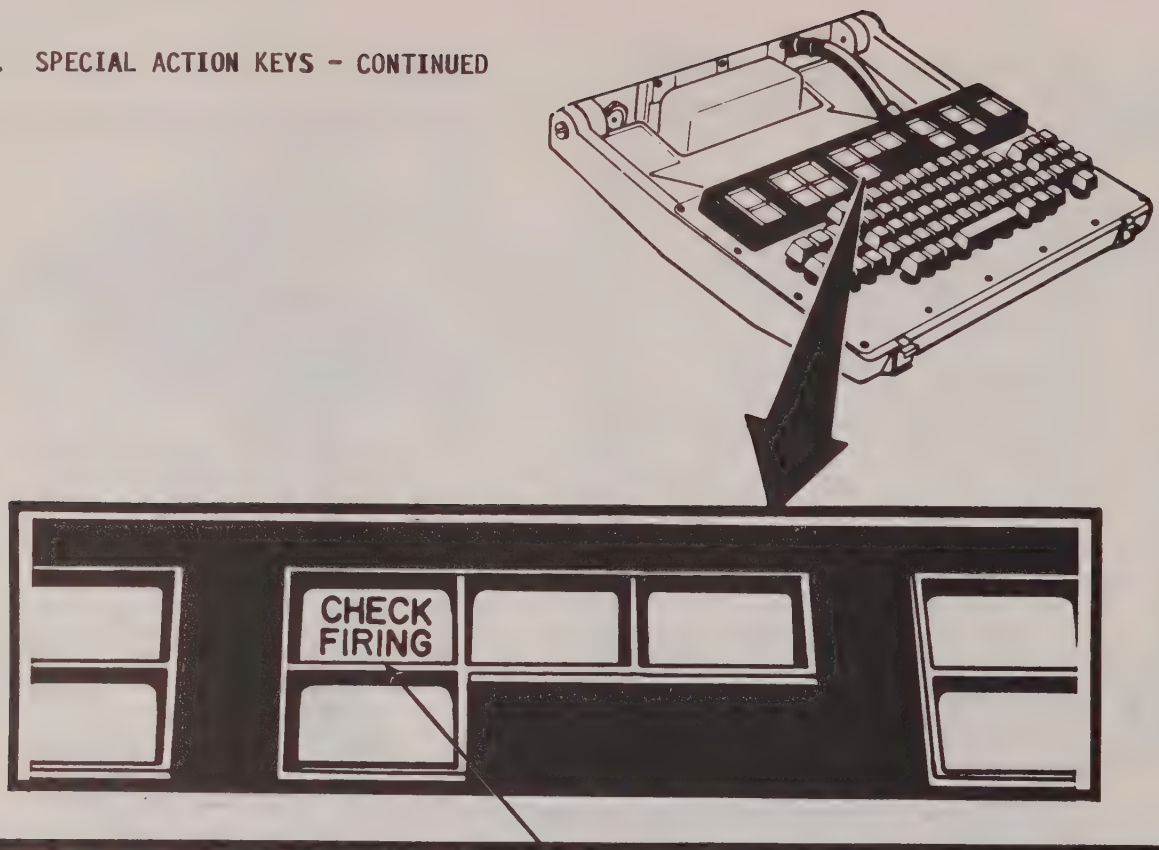


CLEAR Key

When the CLEAR key is pressed:

- displayed message is removed from the lower display, but it is not deleted from the input queue or data base
- system warnings are cleared from the lower display
- FM;COMNDS message (HIP weapon model) for selected howitzers or firing commands (non-HIP weapon models) for selected howitzers, unless it is the last or adjusting howitzer, are cleared from the lower display without deleting them.

2-9. SPECIAL ACTION KEYS - CONTINUED



CHECK FIRING Key

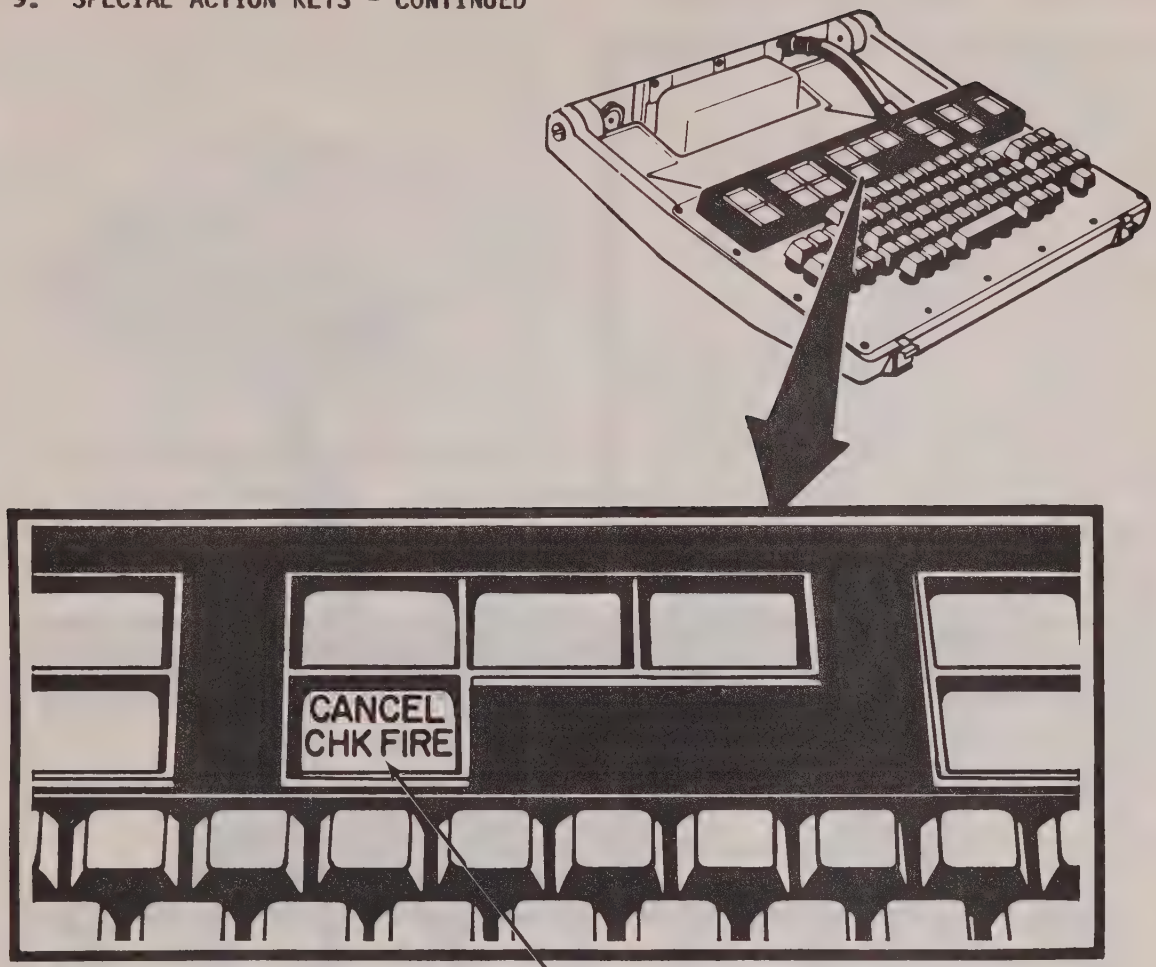
When the CHECK FIRING key is pressed to place all targets in check fire:

- All missions in current mission buffers 1 through 5 are placed in check fire.
- CKFIRE is displayed in the STATUS column for fire missions in current mission buffers 1, 2, and 3.
- CHECKFIRE CHECKFIRE CHECKFIRE is displayed across the middle of the lower display.
- A check firing message is transmitted to all howitzers with a status of Y or C in the OK field of the BCS;PIECES message for non-HIP weapon models or to all HIP howitzers active in the SYS;SBT message.
- For mass fire missions, an FM;CHECK message is automatically addressed and transmitted to all units assigned to the mission.
- For HIP weapon only, CK is displayed on each howitzer's DATA/ACK line of the middle display.

When the CHECK FIRING key is pressed to place a specific mission in check fire:

- CKFIRE is displayed in the STATUS column for that mission.
- A check firing message is transmitted to all HIP howitzers active in the SYS;SBT message or to all howitzers assigned to that mission with a status of Y or C in the OK field of the BCS;PIECES message for non-HIP weapon models.
- For mass fire missions, an FM;CHECK message is automatically addressed and transmitted to all units assigned to the mission.
- For HIP weapon only, CK is displayed on each howitzer's DATA/ACK line of the middle display.

2-9. SPECIAL ACTION KEYS - CONTINUED



CANCEL CHK FIRE Key

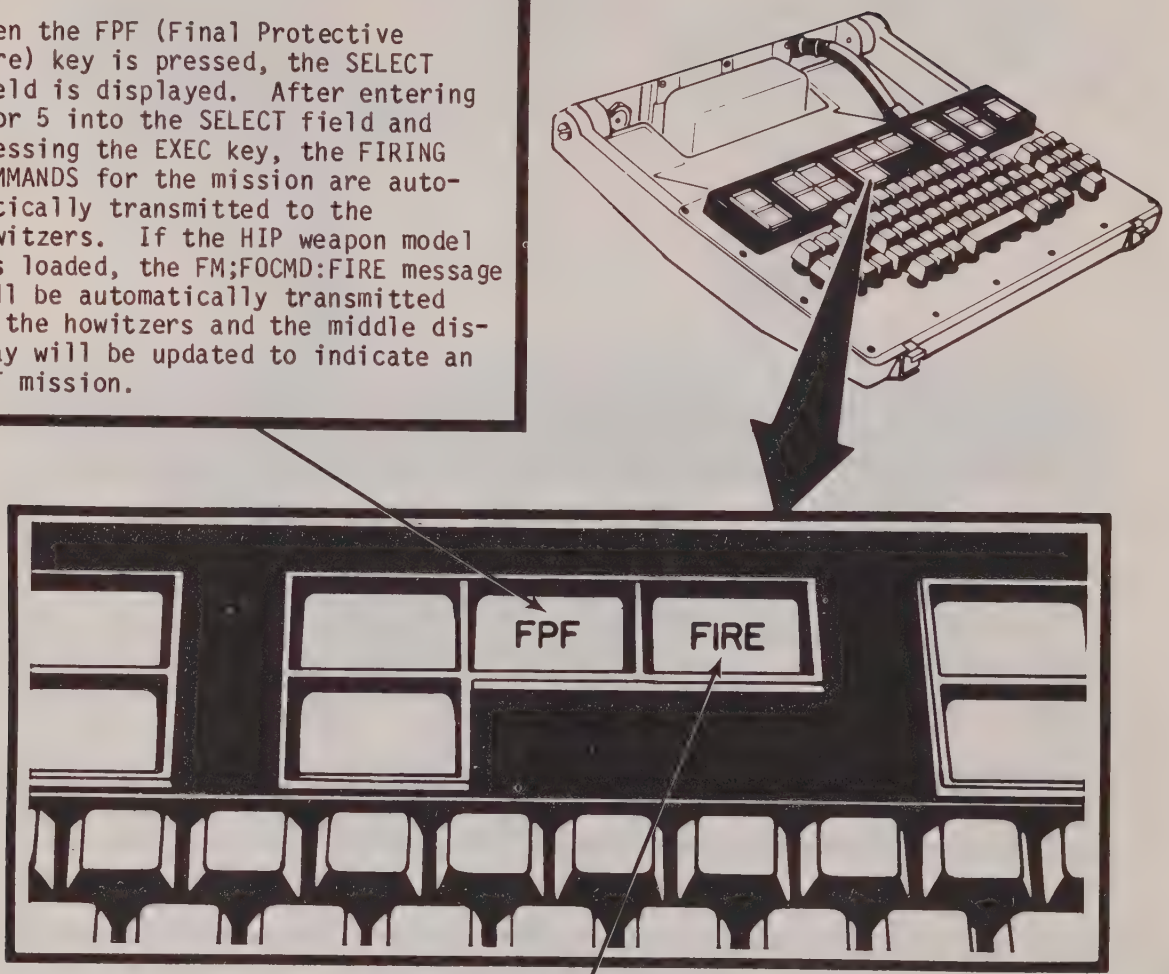
Before pressing the CANCEL CHK FIRE key, you must use the CUR MSN key to select a current mission. When the CANCEL CHK FIRE key is pressed:

- CKFIRE is deleted from the STATUS column for current mission 1, 2, or 3.
- The lower display is cleared if it is displaying CHECKFIRE CHECKFIRE CHECKFIRE across the middle.
- If the STATUS column was not FIRE XXX, MAN XXX, REPLOT, ABORTED, or blank prior to check firing, it displays MAN XMIT.
- If the STATUS column was blank prior to check firing, it is redisplayed as blank.
- If the STATUS column was FIRE XXX or MAN XXX prior to check firing, it displays MAN XXX.
- If the STATUS column was REPLOT prior to check firing, it displays REPLOT.
- If the STATUS column was ABORTED prior to check firing, it displays ABORTED.
- For the HIP weapon model if an ACK was received from a howitzer, CK is cleared from the howitzer's RDS CMPLT line.

2-9. SPECIAL ACTION KEYS - CONTINUED

FPF Key

When the FPF (Final Protective Fire) key is pressed, the SELECT field is displayed. After entering 4 or 5 into the SELECT field and pressing the EXEC key, the FIRING COMMANDS for the mission are automatically transmitted to the howitzers. If the HIP weapon model was loaded, the FM;FOCMD:FIRE message will be automatically transmitted to the howitzers and the middle display will be updated to indicate an FPF mission.



FIRE Key

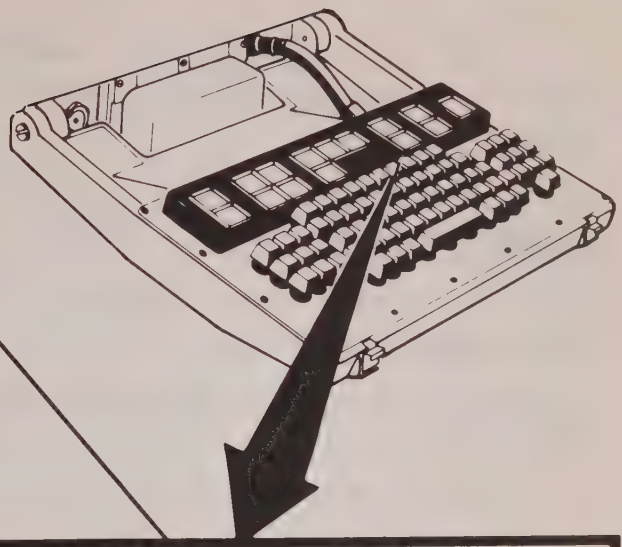
When the FIRE key is pressed:

- TOT (in the MSN column) or AMC (in the STATUS column) is deleted and replaced with FIRE in the STATUS column for the appropriate fire mission.

If the current mission is:

- AMC, the command to fire is transmitted to the howitzers assigned to the mission
- TOT and the clock has run down, the command to fire is transmitted to the non-HIP howitzers assigned to the mission
- TOT and the clock has not run down, the command to fire is delayed until the clock runs down. It is then transmitted to the non-HIP howitzers assigned to the mission.

2-9. SPECIAL ACTION KEYS - CONTINUED

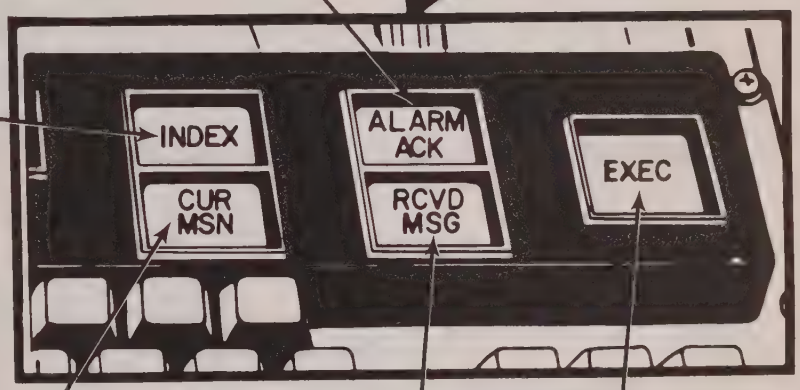


ALARM ACK Key

When the ALARM ACK (alarm acknowledgment) key is pressed, the audible alarm, external message lamp, and CHK FIRE, MSG RCVD, or FIRE MSN indicator lamp are turned off. The ALARM ACK key must be pressed once for each message received or each message generated by the BCS and placed in the input queue with an error.

INDEX Key

When the INDEX key is pressed, the SYS;INDEX message is displayed.



CUR MSN Key

When the CUR MSN (current mission) key is pressed, the SELECT field is displayed. After a mission number is entered and the EXEC key is pressed:

- double squares (▮▮) in the current mission indicator column are displayed next to the number of the selected fire mission
- firing data for the howitzers assigned to the selected mission are displayed for operator review and action.

EXEC Key

When the EXEC (execute) key is press, the display message is processed

RCVD MSG Key

When the RCVD MSG (received message) key is pressed:

- once, the message at the top of the input queue is displayed
- twice, the SYS;IQSUM message is displayed
- the current mission indicator is deleted from the upper display if it is displayed.

Section III. POWER DISTRIBUTION UNIT (PDU)

SECTION CONTENTS	PARA	PAGE
GENERAL INFORMATION	2-10	2-24
PDU CONTROLS AND INDICATORS	2-11	2-25

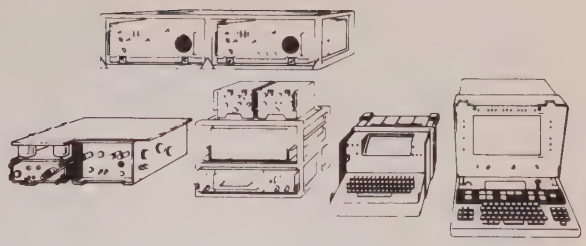
2-10. GENERAL INFORMATION

All power to the BCS comes through the PDU. The controls and indicators on the PDU allow you to:

- apply primary power to all the BCS equipment.
- monitor the availability of power to the BCS equipment and radios
- monitor the status of the batteries and supply emergency power for the BCS memory when the primary power fails.

2-11. PDU CONTROLS AND INDICATORS

The main PDU controls and indicators and their functions are shown below. Refer to TM 11-7440-283-12-1 for a full description of the PDU.

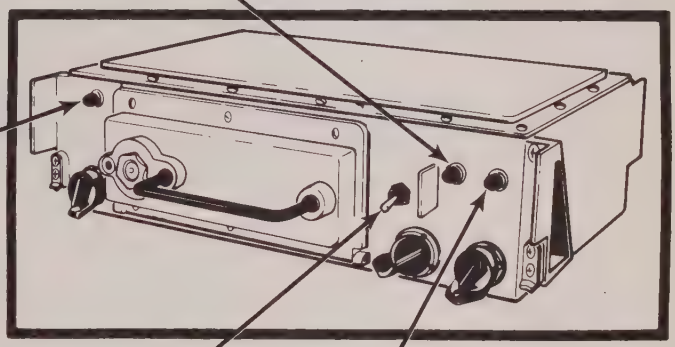


BCS POWER BCU Lamp

The BCS POWER BCU lamp lights when BCS POWER circuit breaker is ON. It shows that power is available to the BCU, printer, and COMSEC equipment.

BAT PWR Lamp

The BAT PWR lamp lights to show the batteries are good and are being used to power the BCS memory.



BCS POWER Circuit Breaker

The BCS POWER circuit breaker applies primary power to all of the BCS equipment and causes the BCS POWER BCU and BCS POWER AUX lamps to light.

BCS POWER AUX Lamp

The BCS POWER AUX lamp lights when BCS POWER circuit breaker is ON. It shows that power is available to the radios.

CHAPTER 3

MESSAGE DATA DISPLAY, ENTRY, AND PROCESSING

OVERVIEW

This chapter introduces data and message processing.

Section I contains information about the data seen on the plasma display. It describes the three sections of the plasma display. Message categories and types, message formats, and the communications line are also described.

Section II explains data entry. It includes the types of data entry and how data is entered, deleted, and changed. It also covers the use of error and warning messages and prompts.

Section III describes message processing. It includes a description of message transmission, authentication, synchronization and resynchronization, reception, and relay.

Section IV provides flowcharts to show you how to manually authenticate a message, resynchronize serial numbers with a subscriber, and relay a message.

Section V provides specific information about the HOW;OBSR and SYS;DMDRLY message formats. The message formats are shown as they appear on the lower display of the BCU. An explanation of the mnemonics used and the legal entries is provided.

CHAPTER CONTENTS

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Section IV.	MESSAGE PROCESSING FLOWCHARTS	3-43
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Section I. DATA DISPLAY

SECTION CONTENTS	PARA	PAGE
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UPPER DISPLAY	3-2	3-5
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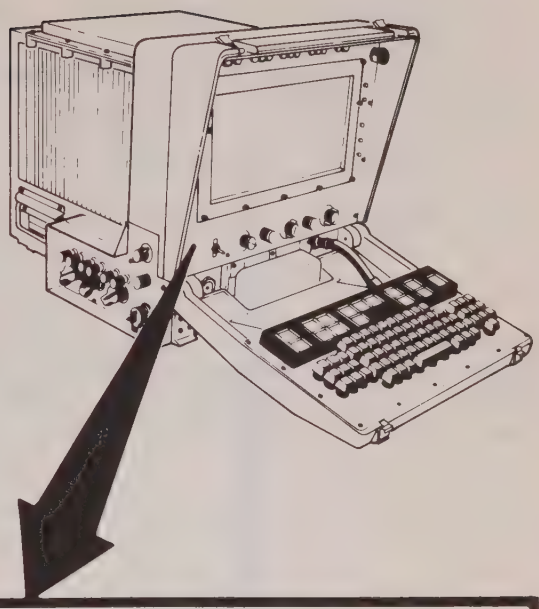
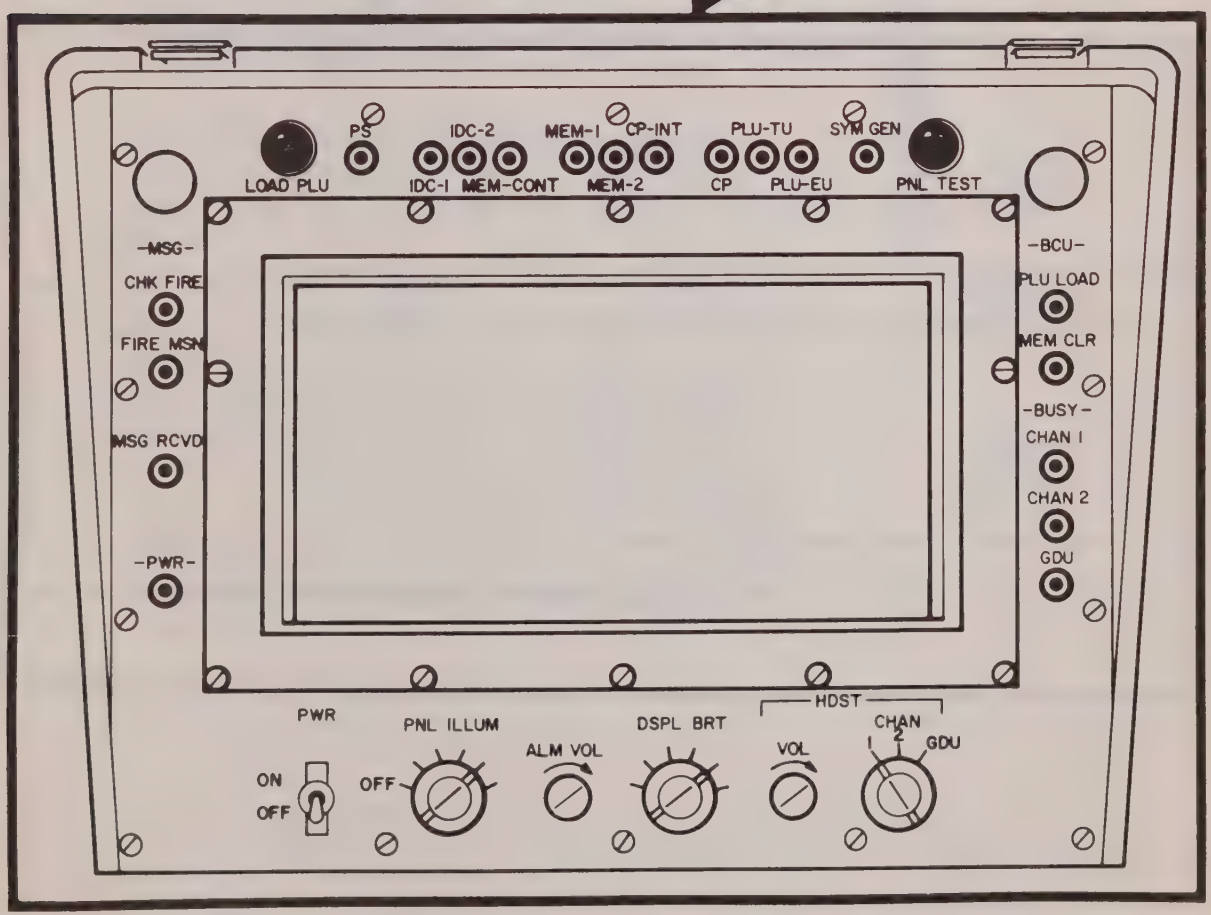
3-1. FRONT PANEL PLASMA DISPLAY

a. Purpose. The plasma display displays data and messages for your information and action. You enter data or information into displayed message formats using the keyboard. When you press the EXEC (execute) key, the computer carries out your instructions. You may be entering data into the memory (data base), recalling information from the data base, or calculating a fire mission. Using the keyboard, you provide the computer with instructions. The results are shown on the plasma display.



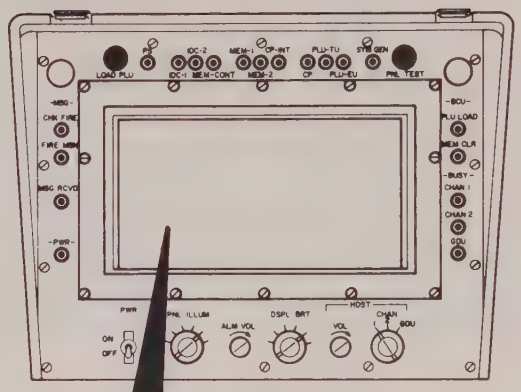


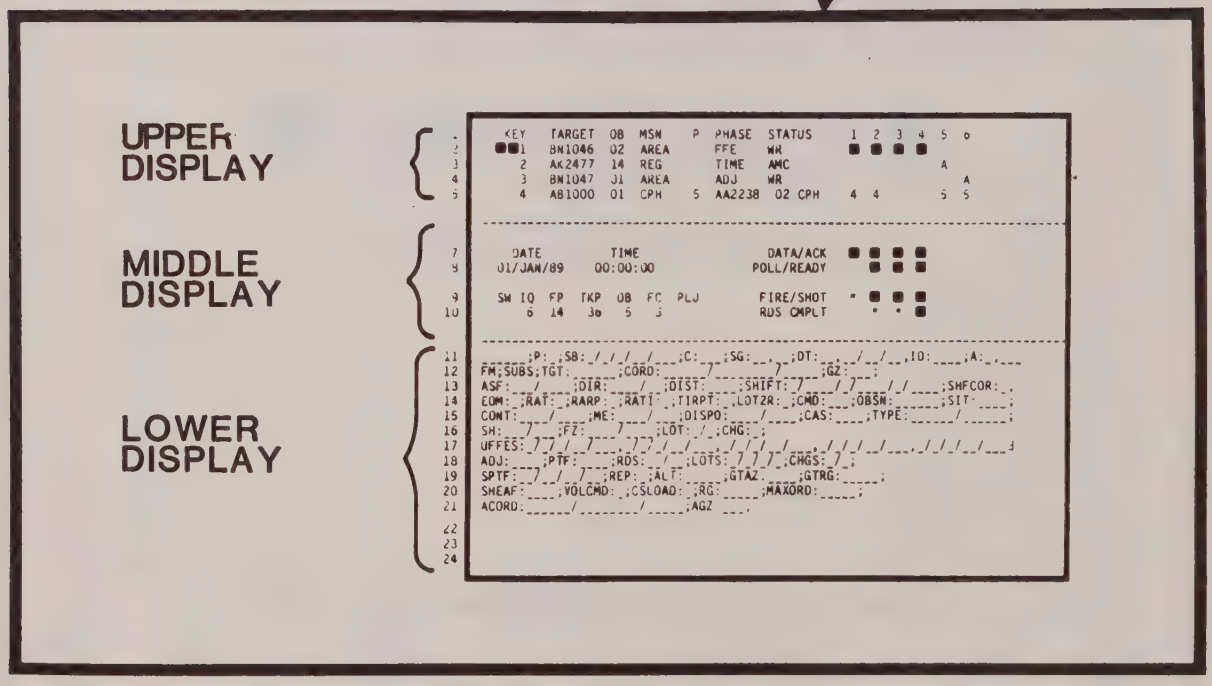
3-1. FRONT PANEL PLASMA DISPLAY - CONTINUED

b. Description. The plasma display is divided into three sections:

- the upper display (lines 1-6)
- the middle display (lines 7-10)
- the lower display (lines 11-24).

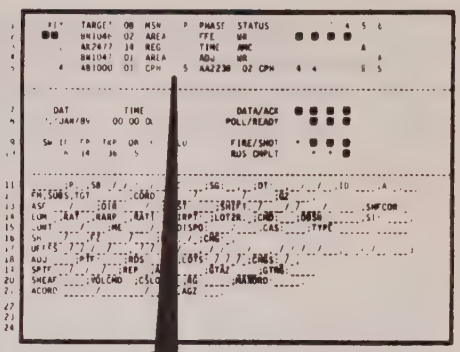
The example below shows the location of the upper, middle, and lower displays. The FM;SUBS message is shown as an example of one message you will see on the lower display.





3-2. UPPER DISPLAY

The upper display is made up of lines 1-6. You cannot enter or change the data displayed on the upper display. The computer automatically enters and changes data on the upper display as you enter and change data on the lower display. The data displayed on the upper and middle displays is a visual presentation of the current status of the BCS.



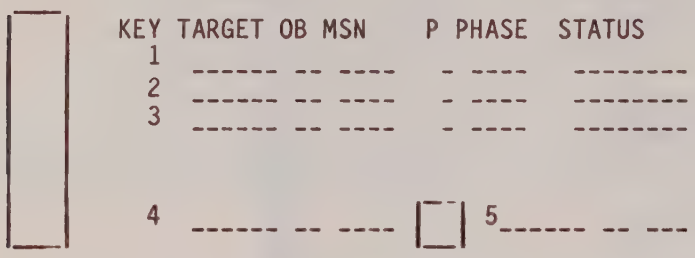
The upper display provides the following information about fire missions stored in the data base:

- which mission is currently being processed
- target number and observer number associated with each mission
- the mission type, priority, phase, and status of each mission
- the gun number of each howitzer, whether it has been sent firing commands, and whether it will be the adjusting howitzer in a mission.

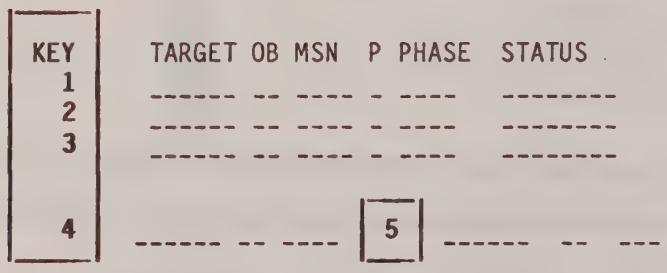
	KEY	TARGET	OB	MSN	P	PHASE	STATUS	1	2	3	4	5	6
2	■■1	BN1046	02	AREA		FFE	WR	■	■	■	■		
3	2	AK2477	14	REG		TIME	AMC					A	
4	3	BN1047	01	AREA		ADJ	WR						A
5	4	AB1000	01	CPH	5	AA2238	02 CPH	4	4			5	5

3-2. UPPER DISPLAY - CONTINUED

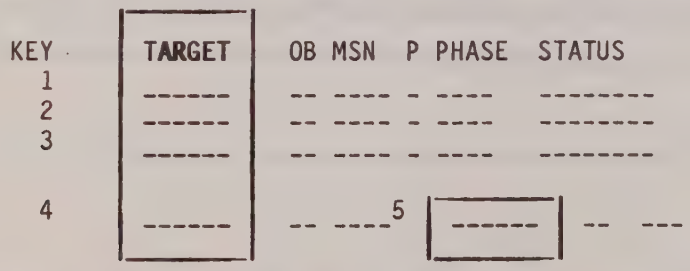
The upper display shows mission status for up to three current missions and either two Copperhead priority missions or one Copperhead priority mission and one Final Protective Fire (FPF) mission. The upper display is divided into several elements Those elements and the information they give you are described below.



Two solid squares (■■) appear on the upper display as the current mission indicator. They indicate which mission a message on the lower display is part of. For missions 1 through 4, the squares appear in the leftmost column of the upper display, next to the number of the appropriate mission. For mission 5, the squares appear directly in front of the 5 on the last line of the upper display.

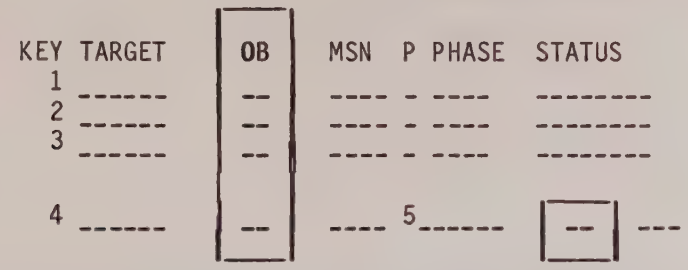


The KEY column shows the mission number for missions 1 through 4. The mission number for mission number 5 is shown on the last line of the upper display under the PHASE column.

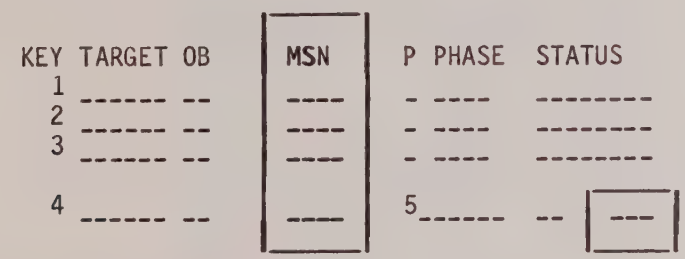


The TARGET column shows the target number associated with the mission for missions 1 through 4. The target number for mission number 5 is shown on the last line of the upper display under the PHASE column. The target number displayed will be two letters followed by four numbers.

3-2. UPPER DISPLAY - CONTINUED



The OB column shows the two-digit observer number associated with the mission for missions 1 through 4. The observer number for mission number 5 is shown on the last line of the upper display under the STATUS column. Values displayed are 00 to 99.



The MSN column displays the mission type for missions 1 through 4. The mission type for missions 1 through 3 will be one of the following:

- AREA - Area fire mission
- REG - Registration mission or registration update
- DES - Destruction mission
- DRAW - Draw mission
- FPF - Final protective fire (priority mission)
- TRIL - Trilateration mission
- TOT - Time on target mission
- CNIL - Continuous illumination mission
- CDIL - Coordinated illumination mission
- CPH - Copperhead mission.

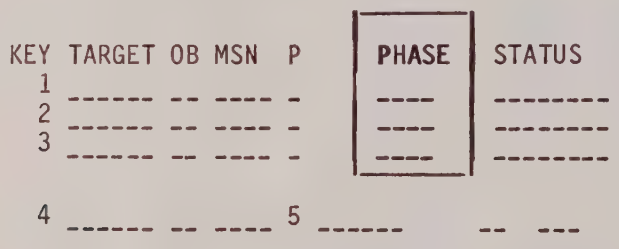
The mission type for mission 5 is shown on the last line of the upper display under the STATUS column. The mission type for mission 4 or 5 will be one of the following:

- FPF - Cannon final protective fire mission
- CPH - Copperhead priority mission.

3-2. UPPER DISPLAY - CONTINUED

The P column shows mission priority for current missions 1 through 3. Values displayed are:

- U - Urgent
- blank - Normal.



The PHASE column shows mission phase for missions 1 through 3. PHASE is not displayed for Copperhead priority and FPF missions. Values displayed are:

- ADJ - Adjust
- FFE - Fire for effect
- LOT1 - Precision registration (lot 1)
- LOT2 - Precision registration (lot 2)
- TIME - Precision registration (time phase)
- REPL - Replot
- HB - High burst registration
- MPI - Mean point of impact registration
- TRIL - Trilateration
- EOM - End of Mission
- DRAW - Draw.

3-2. UPPER DISPLAY - CONTINUED

```
KEY TARGET OB MSN  P PHASE  | STATUS   |
  1 ------ -- ---- - ----   | -------- |
  2 ------ -- ---- - ----   | -------- |
  3 ------ -- ---- - ----   | -------- |
                             ------------
  4 ------ -- ---- 5 ----      -- ---
```

The STATUS column shows the mission status for missions 1 through 3. STATUS is not displayed for Copperhead priority and FPF missions. Values displayed are:

- Blank - The mission is DRAW or TRIL.
- REPLOT - The mission is replot.
- ABORTED - Operator has stopped computation of fire commands. Cancel check fire has been processed on a mission which was check fired during computation of fire commands.
- CKFIRE - Check firing has been sent to all howitzers assigned to the mission.
- CKFIRXXX - Check fire is initiated on an active TOT mission. XXX is the number of seconds left on the countdown clock.
- CS LOAD - Cease load message has been processed. Firing commands have been sent to the howitzers.
- AMC - The mission is not a TOT mission. AMC fire commands have been sent to the howitzers.
- WR - When Ready. Howitzers fire when loaded and ready.
- DNL - Do not load control has been sent to all howitzers in the mission.
- MAN FIRE - The mission is a TOT mission. Countdown clock has reached 000. Order to fire has not been transmitted to howitzers.
- FIRE - If AMC, order to fire has been given and sent to howitzers. If TOT, mission has counted down to 000. Order to fire has been sent to howitzers.
- FIRE XXX - Mission is TOT. XXX is number of seconds until time to send command to fire to the howitzers.

  Example: FIRE 120 means 2 minutes to fire

- MAN XXX - Cancel check fire is processed on a mission which was in MAN XXX or FIRE XXX status when check fire occurred.
- MAN XMIT - New fire commands are computed. They must be manually sent to the howitzers.

3-2. UPPER DISPLAY - CONTINUED

```
KEY TARGET OB MSN  P PHASE  STATUS
 1  ------ -- ---- - ----   --------
 2  ------ -- ---- - ----   --------
 3  ------ -- ---- - ----   --------

 4  ------ -- ----   5  ------ --  ---
```

Missions 4 and 5 are reserved for one cannon FPF and one Copperhead priority mission or two Copperhead priority missions. There are three entries per mission: target number, observer number, and type of priority mission. The possible types of mission entries you will see are:

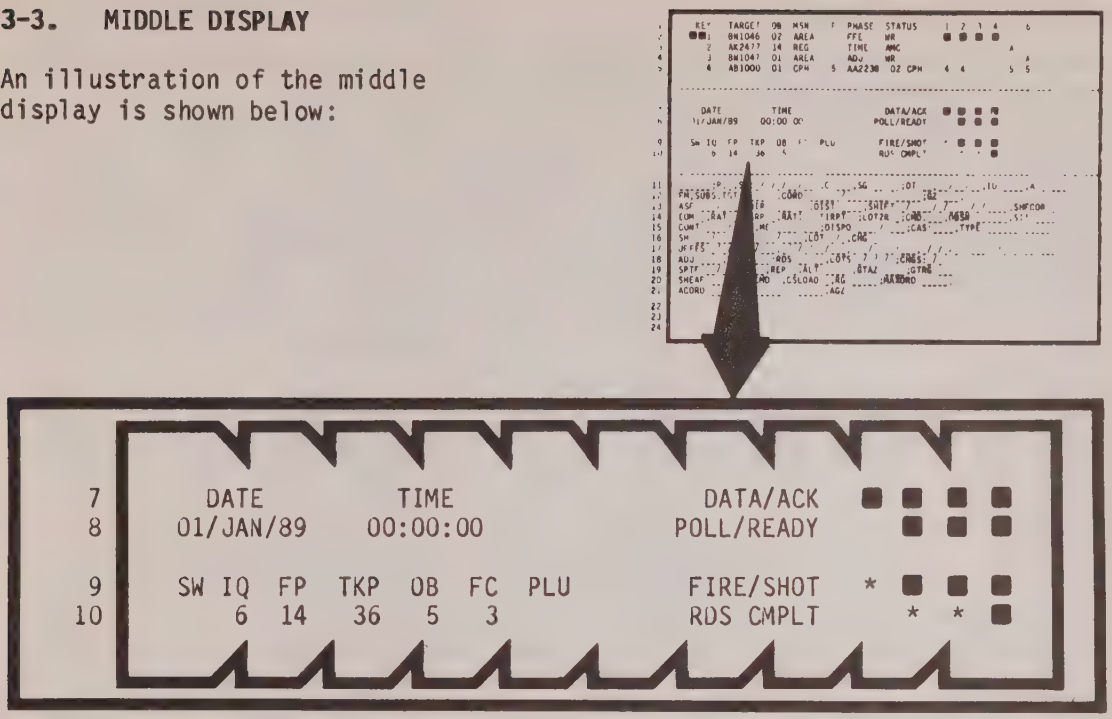
- FPF - Cannon final protective fire
- CPH - Copperhead priority mission.

```
P PHASE  STATUS    1  2  3  4  5  6  7  8  9  10  11  12
- ----   --------
- ----   --------
- ----   --------
5 ------  --  ---
```

These numbers are howitzer numbers. Each howitzer is represented by either its howitzer number (1 through 12) or index number (1 through 8). Only the howitzers stored in the data base will be indicated by number. A solid square (■) under a howitzer number indicates the howitzer is assigned to a mission and has been sent fire commands. The letter "A" under a howitzer number indicates that the howitzer will do the adjusting. The number 4 or 5 appearing under a howitzer number indicates that it is the howitzer assigned to fire current mission 4 or 5 if the mission is a Copperhead priority or FPF mission. If the HIP weapon model is loaded, an H indicates a howitzer is to receive record as target information.

3-3. MIDDLE DISPLAY

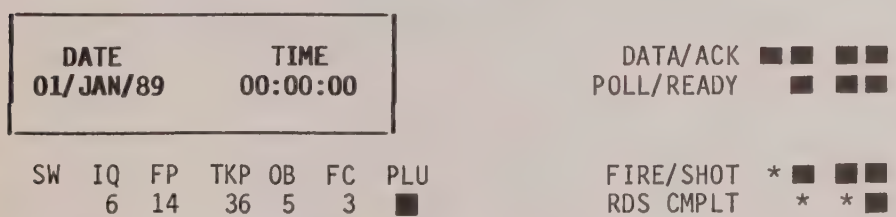
An illustration of the middle display is shown below:



The middle display is made up of lines 7 through 10. You cannot enter or change the data displayed on the middle display. The computer automatically enters and changes data on the middle display as you enter and change data on the lower display. The data displayed on the upper and middle displays is a visual presentation of the current status of the BCS. The middle display indicates the current system date/time, howitzer status, data base files status, input queue status, number of system warning messages, and PLU motion. When the weapon model loaded is HIP, the middle display can also indicate that a howitzer has denied a mission, the status of the howitzers, and that a howitzer is in a check firing status. The middle display also displays angle T when the HIP weapon model is loaded. Each element of the middle display is shown and described below.

---

a. Date and Time Information. The elements of the middle display highlighted below display date and time information. They are described on the next page.



3-3. MIDDLE DISPLAY - CONTINUED

DATE shows the current date based on the entry made into the DATE field of the SYS;SETUP message. Values displayed are:

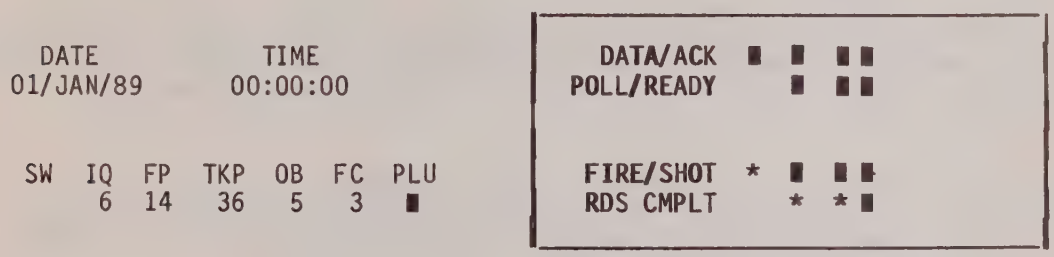
__/ ___/__	Day	1 to 31
__/ ___/ __	Month	First three letters of month
__/___/ __	Year	Last two digits of year

TIME shows the current time based on the entry made into the TIME field of the SYS;SETUP message. Values displayed are:

__: __:__	Hour	0 to 23
__: __: __	Minute	0 to 59
__:__: __	Second	0 to 59

3-3. MIDDLE DISPLAY - CONTINUED

b. Howitzer Status. This part of the middle display displays the status of the howitzers assigned to the current mission. For a non-HIP weapon model, the howitzer's status is shown by an asterisk (*), a solid square (■), or an X in the middle display under the appropriate howitzer number in the upper display. These symbols change to show the exchange of messages between the BCS and the howitzers. This exchange of messages is called polling and is used when the weapon model is non-HIP. The process of polling is described on the following pages. When the weapon model loaded is HIP, the howitzer status is shown by an asterisk (*), a solid square (■), an X, a D, or <NN.



DATA/ACK ■

When this space under a howitzer number is blank, the howitzer is not assigned to a current active mission or no data has been sent to the howitzer.

If the weapon model loaded is non-HIP and an asterisk (*) appears, fire mission data has been sent to that howitzer. If the asterisk (*) changes to an X, the howitzer has not acknowledged receipt of firing commands after three pollings. If the asterisk (*) changes to an X, the howitzer is removed from the polling sequence. If the asterisk (*) changes to a square (■), the howitzer has received the firing commands and has acknowledged them. If the method of control is Do Not Load (DNL), the howitzer will not be polled any further after it has acknowledged receipt of firing commands.

If the weapon model loaded is HIP and an asterisk (*) appears, fire mission data has been sent to that howitzer. An X indicates that no response was received. A solid square (■) indicates acknowledgment. When a D is displayed, an FM;MTO message with DENI was received. If <NN is displayed, the Angle T, in mils, has been computed for a Copperhead mission. The values displayed in the "NN" position are 00 to 32 (0 to 3200 mils).

3-3. MIDDLE DISPLAY - CONTINUED

DATA/ACK ■

POLL/READY

If the method of control is At My Command (AMC), the howitzer will next be polled for a ready status. If the method of control is When Ready (WR), the howitzer will not be polled for a ready status.

If the weapon model loaded is non-HIP and an asterisk (*) appears in this space under a howitzer number, the howitzer is being polled for a ready status. When the asterisk (*) changes to a square (■), the section chief has reported that the howitzer is ready to fire.

If the weapon model loaded is HIP, the asterisk (*) indicates that the FM;FOCMD:READY message is expected. A solid square (■) indicates the FM;FOCMD:READY message was received. In addition, the howitzer's status code from the HOW;UPDATE message can be displayed. Values displayed are:

Y - Operational
O - Out of action
M - Moving
S - Stationary
L - Linked
R - Relay linked
F - Fire Mission (dedicated howitzer)

DATA/ACK ■
POLL/READY ■

FIRE/SHOT

If the method of control is AMC, the howitzer will be polled for FIRE/SHOT after it has reported a READY status. If the method of control is WR, the howitzer will be polled for FIRE/SHOT immediately after it acknowledges receipt of the firing commands. When an asterisk (*) appears in this space under a howitzer number, the howitzer is being polled for FIRE/SHOT. When the asterisk (*) changes to a square (■), the howitzer has reported that the first round has been fired.

3-3. MIDDLE DISPLAY - CONTINUED

DATA/ACK ■
POLL/READY ■
FIRE/SHOT ■

RDS CMPLT

After the howitzer has reported that the first round has been shot, it will be polled for rounds complete. When an asterisk (*) appears under a howitzer number in this space, the howitzer is being polled for rounds complete. When the asterisk (*) changes to a square (■), the howitzer has reported rounds complete. If the weapon model loaded is HIP and a checkfire has been initiated, CK will be displayed.

c. Data Base Files and PLU Motion. This part of the middle display displays information about the status of the data base files. This part of the middle display also indicates when the Program Load Unit (PLU) is moving.

DATE	TIME						DATA/ACK	■	■	■	■
01/JAN/89	00:00:00						POLL/READY		■	■	■
SW	**IQ**	**FP**	**TKP**	**OB**	**FC**	**PLU**	FIRE/SHOT	*	■	■	■
	6	**14**	**36**	**5**	**3**	■	RDS CMPLT		*	*	■

SW	IQ	FP	TKP	OB	FC	PLU
	6	14	36	5	3	■

SW indicates the number of system warning messages currently in the file. The file can hold up to 12 system warning messages. When the file is full, the system warning message at the top of the file will be removed. The remaining 11 messages will be moved up and the new system warning message placed at the bottom of the file.

SW	**IQ**	FP	TKP	OB	FC	PLU
	6	14	36	5	3	■

IQ indicates how many messages the BCS has received and placed into the input queue. This number will blink when an urgent fire mission message is received in the input queue.

3-3. MIDDLE DISPLAY - CONTINUED

SW	IQ	FP	TKP	OB	FC	PLU
	6	**14**	36	5	3	■

FP indicates the number of fire plan targets in the fire plan target file. The file can hold up to 78 fire plan targets. If the file is full and you attempt to enter another target, an error message is displayed.

SW	IQ	FP	TKP	OB	FC	PLU
	6	14	**36**	5	3	■

TKP indicates the number of targets/known points in the target/known point file. The file can hold up to 120 targets/known points.

SW	IQ	FP	TKP	OB	FC	PLU
	6	14	36	**5**	3	■

OB indicates the number of observers in the observer file. The file can hold up to 30 observers.

SW	IQ	FP	TKP	OB	FC	PLU
	6	14	36	5	**3**	■

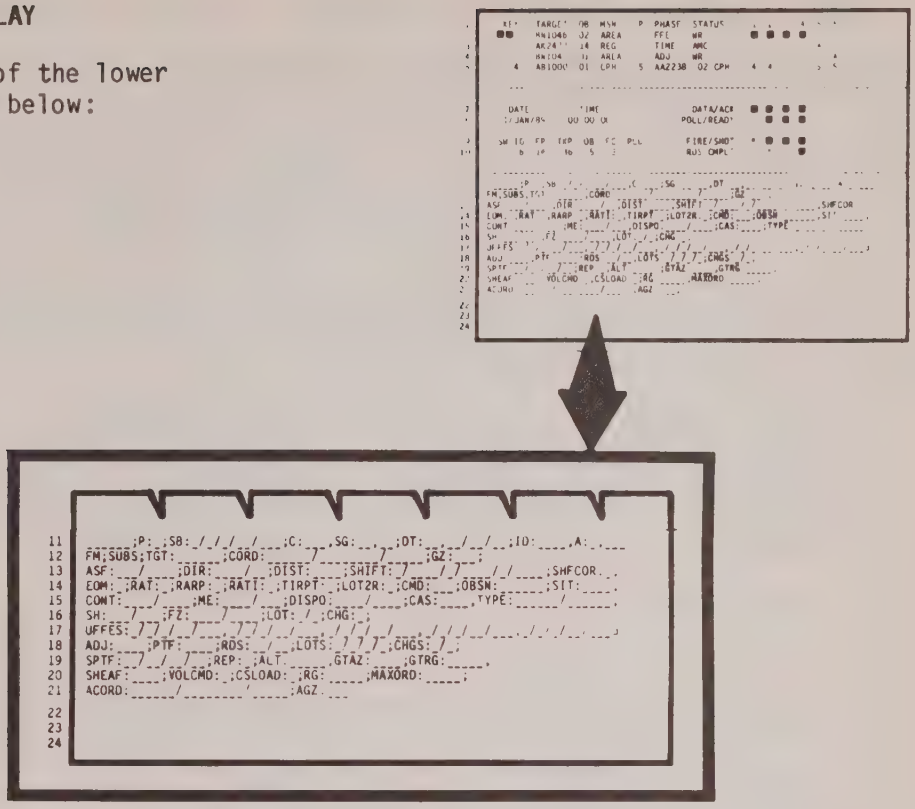
FC indicates the number of fire support coordination measures in the support geometry file. The file can hold up to 12 Fire Support Coordinating Measures (FSCM's) (10 Restricted Fire Areas (RFA's), one 3 to 30 point zone, or one 2 to 30 point Front Line of Own Troops (FLOT)).

SW	IQ	FP	TKP	OB	FC	PLU
	6	14	36	5	3	**■**

A solid box (■) under the PLU heading indicates that the magnetic tape in the TTU is moving. It will be displayed while the weapon-dependent program is being loaded, a previously recorded data base is being loaded, or you are recording a data base. When the box disappears, the tape has stopped moving.

3-4. LOWER DISPLAY

An illustration of the lower display is shown below:



The lower display is made up of lines 11 through 24. Using the keyboard, you may enter data on the lower display. The lower display is used to display:

- the communications (comm) line. The comm line will be displayed on line 11 above all TACFIRE messages and messages which can be transmitted. (Refer to paragraph 3-7.)
- messages for operator review and action (lines 11 to 22). (Refer to chapters 3 through 10.)
- prompts (line 23) which list possible entries in a field or subfield. (Refer to paragraph 3-13.)
- select line (line 23) relating to the displayed message. (Refer to paragraph 3-15.)
- error or warning messages (line 24) relating to the displayed message. (Refer to paragraph 3-14.)

Detailed information about the data displayed on the lower display is provided in the remainder of section I.

3-5. MESSAGE CATEGORIES AND TYPES

a. Message Categories. The messages displayed on the lower display usually begin with two, three, or four letters. These letters identify the category of the message. (See paragraphs a(1), a(2), a(3) and a(4) below.) Following a semicolon will be another group of letters. These letters identify the type of the message. (See paragraph b below.) The BCS Firing Command and BCS;PIECES messages do not follow this method of identifying message categories and types. The information in this paragraph and paragraph b below does not apply to them.

(1) TACFIRE Messages. The messages in the TACFIRE category begin with any one of eight groups of letters. The meaning of each group of letters and an example TACFIRE message are listed below:

MEANING	EXAMPLE
Ammunition and Fire Unit	(AFU;MASK)
Command	(COMD;CC)
Fire Mission	(FM;RFAF)
System	(SYS;PTM)
Meteorological	(MET;CM)
Nuclear/Nonnuclear Fire Planning	(NNFP;FC)
Support	(SPRT;BGEOM)
Artillery Target Intelligence	(ATI;CDR)

TACFIRE messages are transmitted between TACFIRE and the BCS. Since they can be transmitted, a comm line is displayed above all TACFIRE messages. (Refer to paragraph 3-7.)

(2) BCS Messages. The messages in the BCS category begin with the letters "BCS" (Battery Computer System). Two examples of BCS messages are the muzzle velocity derivation message (BCS;MVD) and the target/known point summary message (BCS;TKPSUM). BCS messages are used by the BCS to:

- display data stored in the computer
- input data into the data base
- change data stored in the computer.

(3) BCS System Messages. The messages in the BCS system category begin with the letters "SYS" (System). Two examples of BCS SYS messages are the system weapons index message (SYS;WEAPONS) and the system setup message (SYS;SETUP). Except for the SYS;FORM and SYS;PTM messages which are TACFIRE system messages, BCS system messages cannot be transmitted on channels 1 and 2. Therefore, a comm line will not be

3-5. MESSAGE CATEGORIES AND TYPES - CONTINUED

displayed. For non-HIP weapon models, the SYS;RING message is transmitted to the howitzers by pressing the EXEC key. However, no comm line is displayed. System messages are used by the BCS to:

- prepare the BCS for operation
- display data stored in the computer
- change data stored in the computer
- communicate with howitzers (SYS;RING) (non-HIP).

(4) BCS Howitzer Messages. The messages in the BCS howitzer category are used only when the weapon model loaded is HIP. These messages begin with the letters "HOW" (Howitzer). Two examples of BCS HOW messages are the howitzer ammunition update message (HOW;AMOUP) and the howitzer subscriber table (HOW;SBT). Howitzer messages are used to:

- display data stored in the computer
- input data into the data base
- change data stored in the computer
- transmit information between BCS and the howitzers.

b. Message Types. Each group of letters which identify the message category is followed by a semicolon and another group of letters which identify the type of message. Examples of message types in the BCS category are the command input message (BCS;COMD), the data base summary (BCS;DBSUM), and the fire plan summary (BCS;FPSUM). For other examples of message types, see the subject index in the back of this manual.

3-6. MESSAGE FORMATS

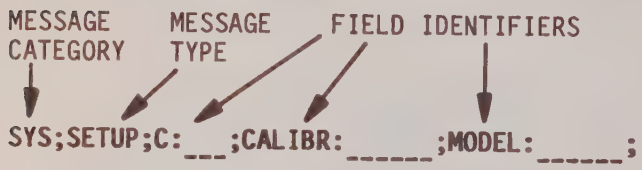
Each message used by the BCS has a standard message format. The format of a message consists of a number of fields. A field contains a mnemonic area, a data area, and punctuation marks. The mnemonic area contains the field identifier which describes the data in the field. The data area contains data previously entered, or blank spaces if no data has been entered. Message formats also contain punctuation marks to help you read the message more easily. A message format without any data entered into the blank spaces is called a message skeleton. A message skeleton for a particular message will look the same each time the message is displayed. The message skeleton of the SYS;SETUP message (non-HIP) is shown below:

```
SYS;SETUP;C:___;CALIBR:______;MODEL:______;
TIME:__/__/__;DATE:__/___/__;DRI:_;TGTNO:______/____;
METUSE:_;METUPD:_;METDEL:_;
ATP:_;MPOLL:_;PRINT:_/_;SCREEN:_;
CPHVTI:__;FSOXMIT:_/_/_/__/___;
GDUPREAM:___;BEEP:_;
```

3-6. MESSAGE FORMATS - CONTINUED

a. Mnemonic Area. A mnemonic area is the part of a field in a message format that contains a mnemonic (memory aid) for a field identifier. The message category and message type of a message format are also mnemonic areas. A mnemonic area is protected from any operator or computer generated change. When you move the cursor across the display, note that the cursor skips over the mnemonic areas. It will stop only at a space in an unprotected data area. The mnemonic areas of the first line of the SYS;SETUP message are shown below.

MNEMONIC AREAS



b. Data Area. A data area is the part of a field in a message format where data can be entered or changed by the operator or the computer. In a message skeleton, data areas are made up of blank spaces. Using the keyboard, you can enter a letter, number, or special character in a blank space of any data area which is unprotected. The cursor will stop at data areas which are unprotected. You cannot make any entries or changes in data areas which are protected. The cursor will not stop at data areas which are protected. The data areas of the first line of the SYS;SETUP message are shown below:

DATA AREAS

The computer can also make data entries into data areas. Sometimes you can change what the computer enters, and other times you cannot. (Refer to paragraph 3-8 for a discussion of the operator and computer generated entries.)

c. Message Punctuation Marks. The punctuation marks in a message skeleton are also protected. The purpose of each punctuation mark is explained below:

- A colon (:) is used to separate the field identifier from the data area which follows it. (PRINT |:| _/_;)
- A semicolon (;) is used after the last space in a field. (PRINT:_/_ |;|)
- A slash mark (/) is used to divide a data area into two or more subfields. (PRINT:_ |/| _ ;)

3-6. MESSAGE FORMATS - CONTINUED

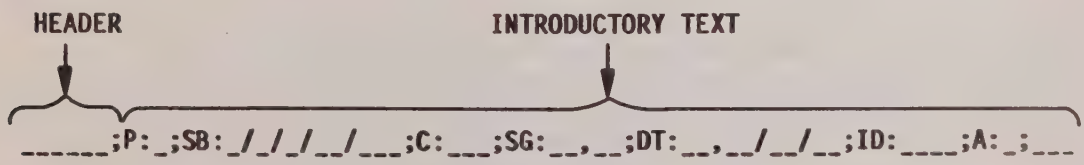
- A comma is used to separate one group of subfields from another group of subfields when multiple entries are possible.
  (PLOT:_____/_/____ |,| _____/_/____ |,| _____/_/____;)
- A decimal point is used for numbers which are carried to the tenths or hundredths place. (MAJX:_____ |.| __;)
- An upside down F (ꟻ) is used as the End Of Transmission (EOT) marker. It signals the computer to stop transmitting a message. Fields after the EOT symbol contain data that is used only by BCS. These fields will not be displayed at TACFIRE.

3-7. COMMUNICATIONS (COMM) LINE

The communications (comm) line is displayed on line 11 of the lower plasma display and provides information about the message being transmitted or received. It is always displayed just above TACFIRE category messages. It is also displayed above the BCS and SYS category messages that can be transmitted.

- When you receive a message, you are not required to enter any data in the comm line.
- When you transmit a message, you are not required to enter any data in the comm line except in the HEADER, SB field, and the A field, as noted below.

The comm line is made up of the HEADER and the INTRODUCTORY TEXT.



---

a. Header. The header is the first six spaces of the comm line.

|_____; | P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___

The header provides instructions to the computer for the transmission of messages. The header format is the same for all messages. The computer will enter all the required data unless an unencrypted message is being transmitted. (See paragraphs 3-22 and 3-23 for manual entry authentication.)

3-7. COMMUNICATIONS (COMM) LINE - CONTINUED

[_] -----;

Position 1 contains the destination address. When a message is transmitted, the computer will enter the subscriber's source address in this position. (Refer to the CA field of the SYS;SBT message.) On an incoming (received) message, the entry for destination address is the source address of your BCS. (Refer to the ADDR field of the SYS;COMM message.) Values displayed are A to Z, 0 to 9, or one of the following special characters: -, #, &, +, ?, or *.

- [_] ----;

Position 2 indicates the number of times the message has been retransmitted. If you are transmitting a message and the link is unencrypted, you must make an entry in this field. One of the following values is displayed:

0 - First transmission try
1 - Second transmission try
2 - Third transmission try
3 - Fourth transmission try

-- [__] --;

Positions 3 and 4 display either a serialization number or a two-character authentication code. These fields are used in authentication and synchronization of messages. If you are transmitting a message and the link is unencrypted, you must make an entry in this field. If the HIP weapon model is loaded and the destination subscriber is HIP, you are not required to make entries in this field. (Refer to section IV of this chapter for procedures for authentication and resynchronization.)

3-7. COMMUNICATIONS (COMM) LINE - CONTINUED

---- -;

Position 5 contains the message type designator. One of the following values is displayed:

1 - Check Fire/Cancel Check Fire
2 - Fire Mission
3 - New Message
4 - Test Messagessage
5 - Control Message (ACK/NAK)
6 - Relay
7 - Bit-Oriented Message (BOM)
T - DMD Message (Test)
D - DMD Message (Data)
H - AFCS Message

----- ;

Position 6 contains the address of the sender of the message. (Refer to the CA field of the SYS;SBT message.)

NOTE

When the weapon model loaded is HIP, the header will contain three more character spaces. These spaces will not be displayed. Positions 7 and 8 are used to designate individual howitzers. Position 9 is not used.

3-7. COMMUNICATIONS (COMM) LINE - CONTINUED

b. Introductory Text.

```
______; | P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___ |
```

The introductory text is the remainder of the comm line. It provides information about the messages transmitted between:

- your BCS and a howtizer
- your BCS and another BCS
- your BCS and TACFIRE
- your BCS and a TACFIRE DMD, a FIST DMD, a Firefinder, an RPV, an ATHS, a MDS, or a VFMED.

An explanation of the data in each field of the introductory text follows.

```
______; | P:_; | SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
```

P indicates message priority by displaying the numbers 1 (highest) through 3 (lowest). BCS does not use this field to prioritize messages. Messages received are given priority according to the message lamp lit. (Refer to paragraph 5-25.) On message reception, the field is displayed as received. You are not required to make an entry into the P field.

3-7. COMMUNICATIONS (COMM) LINE - CONTINUED

_____;P:_; | SB:_/_/_/__/___; | C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___

SB indicates the receiver or sender of the message. When manually transmitting a message, you must enter the subscriber's unit identification in the SB field. If the weapon model loaded is HIP and you are transmitting a message to a howitzer(s), the first subfield must contain an asterisk (*) which represents the howitzer. Beginning with the next subfield, enter the number of the howitzer(s) you wish to receive the message. Do not leave any blanks between entries. If you enter only an asterisk, this represents that all howitzers are to receive the message. For any weapon model, if you enter ALL into the last subfield of SB in a SYS;PTM message, this represents that all subscribers are to receive the message. When automatic and semi-automatic transmission is being used, the BCS completes this field for you. This identification must be entered exactly the same as the unit identification assigned in the system subscriber table message (SYS;SBT). (Refer to paragraph 4-13.) The SB field of a received message will indicate the unit identification of the sender of the message. Values displayed by the computer or legal entries made by the operator are:

SB: | _/ | _/_/__/___;	Section	One alphanumeric character
SB:_/ | _/ | _/__/___;	Platoon	One alphanumeric character
SB:_/_/ | _/ | __/___;	Battery	One alphanumeric character
SB:_/_/_/ | __/ | ___;	Battalion	One or two alphanumeric characters
SB:_/_/_/__/ | ___; |	Regiment	One to three alphanumeric characters

If you are manually transmitting a message to a subscriber named FIST number 1, you must enter the subscriber in the SB field of the comm line to look like this:

SB:F/I/S/01/___;

This is because you initialize the BCS to show FIST number 1 in the SYS;SBT message to look like this:

L:F/I/S/01/___;

3-7. COMMUNICATIONS (COMM) LINE - CONTINUED

```
______;P:_;SB:_/_/_/__/___; | C:___; | SG:__,__;DT:__,__/__/__;ID:____;A:_;___
```

C indicates the security classification of the message. You are not required to enter any data in the C field. The computer automatically assigns the classification to each message. (Refer to appendix H.) Values displayed are:

UN - Unclassified
ETO - Encrypted for Transmission Only
C - Confidential
S - Secret
CFR - Confidential - Formerly Restricted Data
SRD - Secret Restricted Data
C*C - Confidential/Crypto
S#C - Secret/Crypto

```
______;P:_;SB:_/_/_/__/___;C:___; | SG:__,__; | DT:__,__/__/__;ID:____;A:_;___
```

The first subfield of the SG field indicates the segment of the message being displayed. The second subfield indicates the total number of segments in the message. You are not required to enter any data in the SG field.

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__; | DT:__,__/__/__; | ID:____;A:_;___
```

DT indicates the date and time the message was received. You are not required to enter any data in the DT field. The computer will enter the current date and time when a message is received. Values displayed are:

DT: | __, | __/__/__;	Day	01 to 31
DT:__, | __/ | __/__;	Hour	00 to 23
DT:__,__/ | __/ | __;	Minute	00 to 59
DT:__,__/__/ | __; |	Second	00 to 59

3-7. COMMUNICATIONS (COMM) LINE - CONTINUED

_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__; **ID:____;** A:_;___

ID indicates an identification number assigned in sequence to each received or transmitted message by the computer. You are not required to enter any data in the ID field. Values displayed are 0001 to 9999.

_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____; **A:_;** ___

The A field indicates whether the message is to be transmitted with or without encryption, the message is to be relayed, net sensing override is to be used, or that a message received from TACFIRE was automatically transmitted. Legal entries (values displayed) are:

O - a classified message is to be transmitted in the clear
R - a message has been relayed
N - net sensing is to be overridden
A - a message received from TACFIRE was automatically transmitted
B - a message is a blank skeleton in response to a SYS;FORM request (inserted upon transmission)
Blank - a message is to be sent encrypted

NOTE

Check with your FDO before sending the message in the clear.

_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_; **___**

The first space after the last semicolon indicates the communication channel used to receive the displayed message. You are not required to enter any data in this field. Values displayed to indicate communication reception are 1 or 2. The last two spaces after the last semicolon are not used by BCS. They will not be displayed on the screen of the BCU.

Section II. DATA ENTRY

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3-8. TYPES OF DATA ENTRY

The data in the data area of a field of a message is entered by the operator or by the computer as discussed below:

a. Operator Entries. The data entered into the fields of a message by the operator are either required entries, conditional entries, or optional entries. This manual will tell you whether the entry is required, conditional, or optional.

(1) Required Entries. Data entry in a field may be identified as being a required entry. Data must be entered into that field before the computer will take action on the message.

(2) Conditional Entries. If an entry in a field of a message is identified as being a conditional entry, data is required in the field only under certain conditions.

(3) Optional Entries. If an entry in a field of a message is identified as being an optional entry, the computer will take action on the message even if the field is left blank.

b. Computer Entries. The data in the upper and middle displays and in the data areas of some message fields is automatically displayed by the computer. The entries in data areas made by the computer are either computer generated entries or default values. This manual will tell you whether an entry is computer generated. In addition, if a field has a default value, it will be listed.

(1) Computer Generated Entries. The computer will automatically enter and display data in the upper and middle displays and in data areas of various message fields. It will also update this data as new information is received. Most

3-8. TYPES OF DATA ENTRY - CONTINUED

computer generated entries (other than default values) in message formats are made in data areas that are protected. Others are made in data areas that are unprotected. You may change computer generated entries that are made in unprotected data areas. (Refer to paragraph 3-6b.)

(2) Default Values. Some data areas have default values. These values are automatically entered by the computer when the message is executed. You can override a default value. To do so, place the cursor over the value to be changed and enter the desired value.

3-9. ENTERING DATA

When you are entering information (data) into a message format, you must first ensure that the entry is in a form that the computer will accept for processing. Entry in this form is called a legal entry. For example, the computer will accept only a target number that consists of any two letters followed by four numbers. If you attempt to enter a target number in any other form, the computer will reject the entry and will cause an error message to appear on the lower plasma display. Detailed instructions regarding legal entries for all the message formats that you will be working with are contained in this manual. (See the sections in chapters 3 through 10 which provide field-by-field descriptions of the message formats.)

You should enter data into the message formats using the following procedure:

- Check the message category and type to make sure the correct message format is displayed.
- Move the cursor to the HOME position.
- Enter data from left to right, moving down one row at a time. You may use any of the cursor control keys or editing keys to position the cursor. Holding down any of these keys for more than 1 second causes a repeat action of the key.
- Review the data to make sure the data entered is correct.
- Press the EXEC or XMIT key to process the message.

3-10. DATA CONSISTENCY CHECKS

The computer checks the entries in each field for consistency after the EXEC (execute) or XMIT (transmit) key is pressed. The computer checks to see that you have made all the required entries. It also checks to make sure that the data you have entered in one field does not contradict data entered in another field. If an error is found, an error message will be displayed below the message. The computer will not take further action on the message until the error is corrected. Information about consistency checks made by the computer is given in the same paragraph where the message format is explained or in one of the appendixes.

3-11. DELETING DATA

There are times when you may want to delete (erase) data in a message and not replace it with any other data. You may use the ERASE, CHAR DEL, or CHAR INS keys to remove data from a message. Chapter 2 provides a complete description of these keys.

3-12. CHANGING DATA

You will have to change data in message formats when you see mistakes or when you update the information. There are several ways this can be done. The easiest way is to position the cursor over the letter or number you want to change and type in the new data. The new letter or number replaces the old letter or number. You may also use the ERASE, CHAR DEL, or CHAR INS keys to change data.

3-13. PROMPTS

One of the aids the computer provides is called a prompt. When the cursor first outlines a character space in a field, the possible entries or the range of entries is displayed on line 23 of the lower display. Some examples are shown below.

a. Possible Entry Prompts. Possible entry prompts list the entries that may be entered into a particular field. Two examples are shown below.

ATP:_;MPOLL: [_] ;PRINT:_/_;SCREEN:_;

When the cursor outlines the MPOLL field of the SYS;SETUP message, line 23 at the bottom of the lower display will show:

PROMPT: X, blank

This means the only permissible entries are X and blank. Entering an X tells the computer that manual polling will be used. Leaving the subfield blank tells the computer that automatic polling will be used. (Refer to paragraph 4-10.)

METUSE:_;METUPD: [_] ;METDEL:_;

When the cursor first enters the METUPD field of the SYS;SETUP message, the prompt line will show:

PROMPT: 1 TO 2

The permissible entries for this field are 1 and 2. Any other entry will cause an error message to be displayed when you press the EXEC key. (Refer to paragraph 4-10.)

---

b. Range of Entry Prompts. Range of entry prompts list the range of numbers or letters that may be entered into a particular field. The TIME field in the

3-13. PROMPTS - CONTINUED

SYS;SETUP message and the LOT field of the FM;RFAF message are shown below to illustrate the range of entry prompts.

TIME: [__/] __/__;

When the cursor is on the first subfield of the TIME field of the SYS;SETUP message, the prompt line will show:

PROMPT: 0 TO 23

Because this subfield displays the hour, the prompt tells you to enter any number from 0 to 23.

LOT: [_/] _;

When the cursor is on the first subfield of the LOT field of the FM;RFAF message, the prompt line shows:

PROMPT: A TO Z

Because this subfield displays shell lot, the prompt tells you to enter any letter from A to Z.

3-14. ERROR AND WARNING MESSAGES

Error and warning messages are displayed on the lower display of the BCU. Appendix E contains a list of error and warning messages. It also contains tables which explain the cause of each error or warning and the action required to correct the problem.

a. Error Messages. The BCS displays an error message when processing of a message cannot be completed because of incomplete or illegal data entries. The error must be corrected before the BCS can complete the processing of the message. The BCS will also display an error message when ballistic computations cannot be calculated for a specific howitzer.

b. Warning Messages. The BCS also displays warning messages. Warning messages that are associated with a particular message will be displayed below the message. Warning messages indicate that processing of a message has been completed. However, one or more elements of the solution require either notification of your supervisor or some other action.

c. System Warning Messages. The BCS also displays system warning messages. When a system warning occurs, the number under SW in the middle display will be increased. (Refer to paragraph 3-3.) The number will blink until you display the SYS;WARNS message. (Refer to paragraph 5-23.) System warning messages are not associated with a particular message.

3-15. SELECT LINE

The select line is displayed on line 23 of the lower display. Except for the SYS;WARNS message, the SELECT line appears below all index and summary messages. It is used to make selections from an index or summary message.

Section III. MESSAGE PROCESSING

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3-16. MESSAGE TRANSMISSION

The computer accomplishes the following before, during, and after transmission of a message:

a. Message Formatting. The computer formats the message by:

- adding the comm line to the message. (The destination of each message is determined by the logical subscriber name in the SB field of the comm line. It must be exactly the same as the subscriber name entered in the system subscriber table (SYS;SBT) message. If you press the XMIT key when an invalid name is in the SB field of the comm line, the message will remain on the lower display with an error message.)
- entering data into the body of the message. (The message data is entered either by the operator using the keyboard or by the computer as a result of processing another message.)
- adding an End of Transmission (∃) character at the end of the message.

b. Message Transmission. When the XMIT key is pressed, the message to be transmitted will be placed in an output buffer. The computer checks the comm channel to be used. If it is free, the message is transmitted. If the output buffer for the desired comm channel is full, the BUSY CHAN lamp for the channel will light. You will not be able to transmit a message on this channel until the lamp goes out. If you have been directed to do so by your FDO, you may use net sensing override in order to transmit the message. In order to use net sensing override, you will place an X in the COMOVR field of the SYS;COMM message (refer to paragraph 4-12) and place an N in the A field of the comm line (refer to paragraph 3-7).

c. Message Response. When a message has been transmitted successfully, the sender of the message will receive an Acknowledgment (ACK) message. If a transmitted message has not been serialized correctly with the subscriber, the sender will receive a Negative Acknowledgment (NAK) message. The incorrectly serialized message will be placed in the input queue with a warning message attached. If a transmitted

3-16. MESSAGE TRANSMISSION - CONTINUED

message is not acknowledged by a subscriber within a certain amount of time, the computer will transmit the message again up to three more times. If it is still not acknowledged, the message will be placed in the input queue with an error message attached and the MSG RCVD lamp will light.

3-17. AUTHENTICATION

Authentication is the process of verifying that a received message is from a valid subscriber. This involves the use of the Sequence Index (SI) number. The SI number is the last two digits of the message serial number. The SI number is matched with a code number. These numbers are found in Communication Electronics Operating Instruction (CEOI) or Communication Electronics Standing Instruction (CESI) authentication tables. The code numbers are also called authenticators. You must enter these authenticators into the header of the comm line. When this is done, the message can be transmitted. (Refer to paragraph 3-23.) There will never be a need to authenticate a message transmitted to or received from a HIP howitzer.

NOTE

If you receive a message with authenticators, check them against the values listed in your CEOI/CESI tables. If the authenticators do not match, either the message is suspect or resynchronization with your subscriber is required.

3-18. SYNCHRONIZATION AND RESYNCHRONIZATION

a. Synchronization. The computer uses a counting system to keep track of each message transmitted to or received from each subscriber. The counting system is set up when data is entered into the S field of the system subscriber table (SYS;SBT) message. The numbers in the S field are the serial numbers which will be assigned to the next message sent to each subscriber and the next message received from each subscriber. The "send" number in the computer at your BCS must equal the "receive" number in the computer of a subscriber. In other words, the serial number assigned to the next message you send to him must be the same as the serial number assigned to the next message he receives from you. Similarly, the "receive" number at your BCS must be the same as a subscriber's "send" number. If serial numbers do not match, a resynchronization procedure must be performed.

b. Resynchronization (Resync). Resync is a process that keeps two devices in agreement on which authenticators/serialization numbers are to be used next. It allows an operator to retransmit a message with correct authentication/serialization after receiving notice that an incorrect set has been transmitted. BCS will automatically resync with a subscriber when BCS transmits an encrypted message and receives a NAK response. Refer to paragraph 3-24 for the resync procedure. There will never be a requirement to resynchronize serial numbers with a HIP howitzer.

If the weapon model loaded is HIP and data is transmitted from the BCS to the howitzers, all howitzers monitor the net and update the receive serial number as appropriate. All howitzers maintain the same receive serial numbers. If a howitzer receives a negative acknowledgment (NAK) from a BCS, the howitzer will automatically

3-18. SYNCHRONIZATION AND RESYNCHRONIZATION - CONTINUED

resynchronize by changing the last two digits of its four-digit transmit serial number to be equal to the expected SI (returned in the NAK) plus one. Table 3-1 is a description of the actions the operator or BCS will take, if any, when a message that is transmitted or received by the BCS is out of synchronization under the circumstances shown.

Table 3-1. Resynchronization Procedures

	Encryption	Manual Authentication
BCS transmits a message	BCS automatically resynchronizes.	BCS displays a NAK message with expected SI. Operator should perform manual resynchronization. If the mes-message is sent to TACFIRE or Fire-finder, you perform resynchronization using voice.
BCS receives a message	BCS displays a warn-ing message with expected SI.	Operator may be required to perform manual resynchronization.
BCS receives a mes-sage from TACFIRE	Operator should per-form manual resynchronization.	Operator should perform manual resynchronization.

3-19. MESSAGE RECEPTION

The computer will accomplish the following when a message is received.

a. Check for Correctness. When a message is received, the computer first checks the message for correctness. This check is made before the message is further processed.

b. Acknowledgment or Ignoring of Messages. The computer then sends the subscriber an ACK message or a NAK message, or it will ignore the message.

(1) Acknowledgment. An ACK message will be transmitted in response if the message:

- is addressed to your BCS or the relay address of one of your subscribers
- is from a legal subscriber
- is serialized correctly
- does not contain an uncorrectable error
- is to be authenticated.

3-19. MESSAGE RECEPTION - CONTINUED

(2) Negative Acknowledgment. A NAK message will be transmitted in response if the message is not serialized correctly. However, a howitzer will never send a NAK.

(3) Ignoring Messages. The computer ignores the message and sends no response if the entry in the SYSTAT field of the SYS;COMM message is OFF or if the message:

- contains a checksum error
- is not addressed to your BCS or the relay address of one of your subscribers.

c. Printing of Messages. Received messages are printed when a printer is on line if the appropriate entry is made in the PRINT field of the SYS;SETUP message. (Refer to paragraphs 4-10 and 4-11.)

d. Check Firing Message. The way in which the BCS processes check firing messages depends upon the status of the AUTH field in the SYS;COMM message.

(1) Processing Check Firing Messages with Manual Authentication (AUTH:). When a check firing message is received, the CHK FIRE lamp will light and the message is posted in the input queue. The operator will manually authenticate the message and execute it. A check firing message is transmitted and the status for the mission changes to CKFIRE in the STATUS column of the upper display.

(2) Processing Check Firing Messages Without Manual Authentication (AUTH:X). When a check firing message is received, the CHK FIRE lamp will light and the check firing message is displayed on the lower display. A check firing message is transmitted. The status for the mission changes to CKFIRE in the STATUS column of the upper display. All this occurs without operator action. If the weapon model loaded is HIP, an FM;FOCMD:CKFIRE message will be transmitted to the howitzers. The status for the mission changes to CKFIRE in the STATUS column of the upper display. The RDS CMPLT line of the middle display will display CK. All of this occurs without operator action.

If a check firing message is being processed and a second check firing message is received, the new check firing message is placed in the input queue. The operator must then display the second check firing message once the first check firing messagehas been processed.

e. Input Queue. When a message is placed in the input queue, an audio alarm will sound. A lamp will light depending on what type of message is received. A check firing message will cause the CHK FIRE lamp to light. A fire mission message will cause the FIRE MSN lamp to light. All other messages will cause the MSG RCVD lamp to light. A warning message is displayed to the operator if the input queue becomes more than 80 percent full. Refer to paragraph 5-25 for a discussion of the SYS;IQSUM message and message priority in the input queue.

3-20. RELAY COMMUNICATIONS

When two devices cannot directly communicate with each other, you will need to perform relay communications. The BCS has the capability to perform the following functions during relay.

- BCS acts as a relayer between two other devices. BCS can act as a relayer for more than one relay. (See figure 3-1.)

Figure 3-1. BCS as Relayer

- BCS uses a third device (relayer) to send and receive messages from another device. (See figure 3-2.)

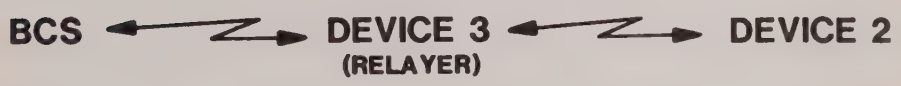

Figure 3-2. BCS Relaying Through Another Device

When BCS is acting as relayer (as in figure 3-1), four kinds of relay are possible. BCS can act as relayer between two fixed-format devices (such as a TACFIRE DMD and a FIST DMD). BCS can act as relayer between a variable-format device (such as TACFIRE) and a fixed-format device (such as a TACFIRE DMD). BCS can act as relayer between two variable-format devices (such as TACFIRE and another BCS). BCS can also act as relayer between a howitzer and another subscriber.

When BCS is relaying through another device (as in figure 3-2), the relaying device must be a BCS or TACFIRE.

3-20. RELAY COMMUNICATIONS - CONTINUED

The following paragraphs describe the different types of relay performed by BCS.

a. BCS as Relayer Between Two Fixed-Format Devices. In order to set up this kind of relay, you must use the RLY field of the SYS;SBT message. First, make entries for each fixed-format device in the SYS;SBT message just as if no relay was to be used. Then you make a unique entry in the RLY field for each fixed-format device in the relay. The entry in the RLY field for each device is the address the other device in the relay will use to address messages to the first device. For example, to establish a relay between DMD number 1 (physical address A, relay address B) and DMD number 2 (physical address C, relay address D), enter B in the RLY field for DMD number 1 and enter D in the RLY field for DMD number 2. DMD number 1 will address messages to DMD number 2 using the address D. DMD number 2 will address messages to DMD number 1 using the address B.

When a device in the relay transmits a message using the RLY address of the other device, the message is received at the BCS. The BCS automatically relays the message to the other device. BCS will:

(1) Change the destination character in the header of the comm line (RLY field entry) to the physical address of the destination device (CA field entry).

(2) Change the source character in the header to the BCS physical address.

(3) If automatic authentication is set and the destination subscriber is not Firefinder, the message is automatically transmitted. (If automatic authentication is not set, the operator will have to manually display, authenticate, and transmit the message.) The S field of the SYS;SBT message will be updated for both devices.

b. BCS as Relayer Between Two Variable-Format Devices. In order to set up this kind of relay, simply enter both devices in the SYS;SBT message just as if no relay was being used. No entry in the RLY field is required for either device.

When one device in the relay transmits a message to the other device for relay through BCS, the message is received at BCS. BCS will:

(1) Change the destination character in the header of the comm line to the physical address of the destination device.

(2) Change the source character in the header to the BCS address.

(3) Change the name in the SB field of the comm line to that of the originating subscriber.

(4) Indicate relay (R) in character position 5 of the header and in the A field of the comm line.

(5) Indicate in the comm line the channel on which the message was received.

3-20. RELAY COMMUNICATIONS - CONTINUED

(6) Convert the message to a Bit Oriented Message (BOM) format if the message is legal for conversion and the destination subscriber is a BCS.

(7) Automatically transmit the message if the link is encrypted. (If the link is unencrypted, the operator will have to manually display, authenticate, and transmit the message.)

c. BCS as Relayer Between a Fixed-Format Device and a Variable-Format Device. In order to set up this kind of relay, you must use the RLY field of the SYS;SBT message. First, make entries for both subscribers in the SYS;SBT message just as if no relay was to be used. Then make a unique entry in the RLY field for the variable-format device. The entry in the RLY field is the address the fixed-format device will use to address the variable-format device.

(1) When the fixed-format device in the relay transmits a message to the variable-format device for relay through BCS, the message is received at BCS. BCS will:

(a) Convert the message to variable format if the destination subscriber is not TACFIRE or another BCS. Otherwise, the received message will be inserted into a SYS;DMDRLY message.

(b) Change the destination character (RLY address) in the header of the comm line to the physical address of the destination device.

(c) Change the source character in the header to the BCS address.

(d) Insert the name of the originating subscriber in the SB field of the comm line to that of the originating subscriber.

(e) Indicate relay (R) in the header and in the A field of the comm line.

(f) Indicate in the comm line the channel on which the message was received.

(g) Automatically transmit the message if the link between the BCS and the variable-format device is encrypted and automatic authentication is set. (If the link is unencrypted or if automatic authentication is not set, the operator will have to manually display, authenticate, and transmit the message.)

(2) When the variable-format device addresses a message to a fixed-format device using the RLY address, the message is received at BCS. BCS will:

(a) Receive the message with the destination character in the header matching the BCS address and the SB field containing the logical name of the destination.

(b) Convert the message to a fixed-format message if the destination subscriber is not TACFIRE or another BCS. Otherwise, the received message will be inserted into a SYS;DMDRLY message.

3-20. RELEY COMMUNICATIONS - CONTINUED

(c) Insert the destination's physical (nonrelay) address into the destination character of the header.

(d) Insert the BCS address into the source character of the header.

(e) Automatically transmit the message if the destination subscriber is not Firefinder, the link between the BCS and the variable-format device is encrypted, and automatic authentication is set. (If the link is unencrypted or if automatic authentication is not set, the operator will have to manually display, authenticate, and transmit the message.)

d. BCS as Relayer Between a Howitzer and an Observer. In order to update the SYS;SBT message so that a howitzer may be dedicated to an observer, the howitzer must be entered twice in the SYS;SBT message. Refer to paragraph 3-21 for a discussion of this type of relay.

e. BCS Relaying Through Another Device. In order to set up this kind of relay, you must enter an R (relay) in the T field in the line of the SYS;SBT message for the device with which you wish to communicate (device two). Also, you must enter the channel number and a physical (nonrelay) address of the relaying device in the CA field in the line of the SYS;SBT message for device two. It is not necessary to make any entries in the S and K fields for device two.

To send a message to device two, address the message by entering the logical name of device two into the SB field of the comm line. When you transmit the message, BCS inserts the address of the relaying subscriber into the destination character of the header of the comm line. If the destination is a fixed format device, the message will be inserted into a SYS;DMDRLY message. If the link between BCS and the relaying device is unencrypted, you must enter authentication codes. The message will be transmitted to the relaying device. The relaying device will relay the message to device two.

3-21. DEDICATED HOWITZER COMMUNICATIONS

When a howitzer is to be controlled by an observer instead of BCS, it is called a dedicated howitzer. Communications between the howitzer and the observer are established using the SYS;SBT and HOW;OBSR messages. (Refer to paragraph 3-27.)

Before executing the HOW;OBSR message to establish the dedication, you must enter the howitzer in the SYS;SBT message twice. The first entry establishes the nonrelay communications between the howitzer and the BCS. The second entry establishes the relay. In the second entry, enter the howitzer with a device type of R. In the CA field, enter a unique address. This address must be different from the address in the first entry for the howitzer in the SYS;SBT message. In the RLY field, enter the address the other BCS subscriber will use to address messages to the howitzer. Also, in the subscriber line of the SYS;SBT message for the other subscriber, enter the address the howitzer will use to address the other subscriber.

The following conditions will also cause an error message to appear when the HOW;OBSR message is executed:

3-21. DEDICATED HOWITZER COMMUNICATIONS - CONTINUED

- The howitzer and observer are communicating on different channels and either or both subscribers have no entry in the RLY field of the SYS;SBT message.
- No HOW;UPDATE message for the howitzer is in the data base.
- Either the howitzer or the observer is not listed in the SYS;SBT message.
- The observer has an entry in the D field other than F, S, T, or Z.
- Either the howitzer or the observer has an entry of N (off) in the T field of the SYS;SBT message.
- The observer in the L field of the HOW;OBSR message is not in the howitzer's HOW;SBT message and that message contains five subscribers.
- If the shell in the HOW;OBSR message is Copperhead and the GLLDCO field of the HOW;OBSR message is blank, the following will cause an error:
  - There is no FM;OBCO message for the observer in the data base.
  - There is an FM;OBCO message for the observer in the data base with no entry in the GLLDCO field.
- The target number block in the HOW;OBSR message is incorrectly entered or overlaps with the BCS target number block.

If no error message appears when the HOW;OBSR message is executed, BCS performs automatic processing to establish a full relay, a half-relay, or a link between the howitzer and the observer.

In a dedicated relay, when BCS receives a message for relay between a howitzer and an observer, BCS will change the destination character (RLY address) in the header of the comm line to the physical (nonrelay) address of the destination device. It will also change the source character in the header to the BCS address. Then it will relay the message without operator action or knowledge.

A full relay occurs when both the howitzer and the observer have entries in their RLY fields of the SYS;SBT message. In a full relay, all messages transmitted between the howitzer and the observer are relayed through the BCS. Both subscribers in the relay use the other subscriber's RLY address when transmitting to the other subscriber.

A half-relay occurs when only the howitzer or only the observer has an entry in its RLY field of the SYS;SBT message. In a half-relay, messages to the subscriber with an entry in the RLY field of the SYS;SBT message will be relayed through the BCS. Messages to the other subscriber will be transmitted directly to that subscriber without being relayed through the BCS. If a subscriber has a RLY address, the other subscriber uses that address when transmitting to the subscriber with a RLY address. If a subscriber does not have a RLY address, the other subscriber uses the address from the CA field of the SYS;SBT message when transmitting to the subscriber without a RLY address.

3-21. DEDICATED HOWITZER COMMUNICATIONS - CONTINUED

A link occurs when neither the howitzer nor the observer has an entry in its RLY field of the SYS;SBT message. In a link, all messages transmitted between the howitzer and the observer are transmitted directly without being relayed. Both subscribers in the link use the other subscriber's address from the CA field of the SYS;SBT message when transmitting to the other subscriber.

To establish a full relay, half-relay, or link, BCS performs the following automatic processing:

- The HOW;SBT message for the howitzer will be updated with data for the observer. The A field (address) for the observer will be entered with the observer's RLY address or CA field address, as applicable. The other fields pertaining to the observer in the HOW;SBT message will be made equal to the data for the observer in the SYS;SBT message. The HOW;SBT message will be automatically transmitted to the howitzer.

- If the shell specified is Copperhead and CLDHT, GLLDCO, or VISIB were not specified in the HOW;OBSR message, the entries in the FM;OBCO message from the data base will be inserted into the HOW;OBSR message.

- The HOW;OBSR message will be transmitted to the howitzer.

- The HOW;UPDATE message for the howitzer will be updated with the contents of the RESTR field of the HOW;OBSR message. The STATUS field will be updated to L (linked) or R (relay or half-relay). The GUNORD field will be updated to blank. The DTG field will be updated to the BCS current system time.

- If the howitzer is not involved in an active mission, the POLL/READY line of the middle plasma display for the appropriate howitzer will be updated to L or R.

- A SYS;PTM message will be formatted and transmitted to the observer. The message will contain the following:

  - The address the observer must use to transmit to the howitzer.

  - The contents of the RESTR field of the HOW;OBSR message.

  - The date/time group when the dedication will end.

  - The number of targets which can be fired during the period of dedication.

  - The shell and fuze to be fired.

During the period of dedication, BCS will monitor communications between the observer and the howitzer. When the howitzer is involved in a fire mission, the howitzer status in the middle display will be an F. The F will remain in the middle display until the mission is ended or until 90 seconds have passed since the beginning of the mission.

Section IV. MESSAGE PROCESSING FLOWCHARTS

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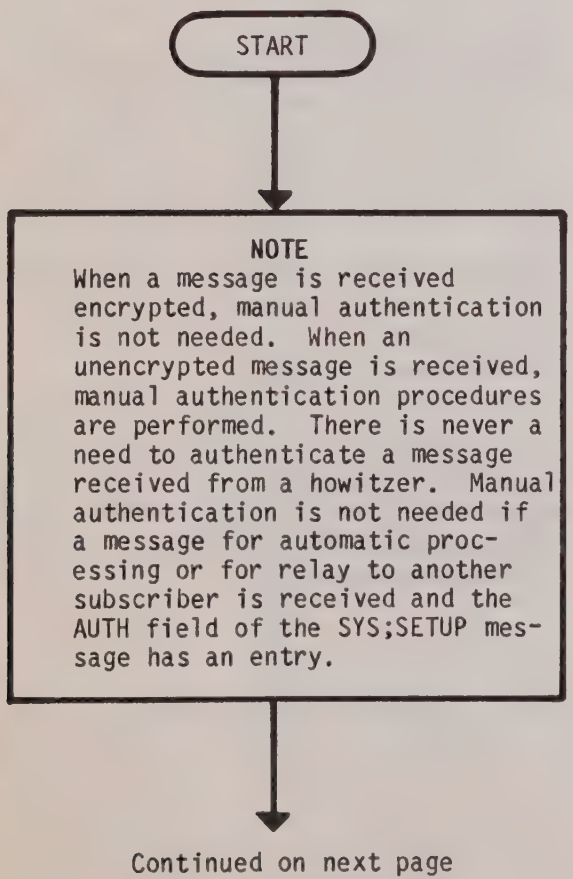
3-22. MANUALLY AUTHENTICATING A RECEIVED MESSAGE

Use this flowchart to perform the following task:

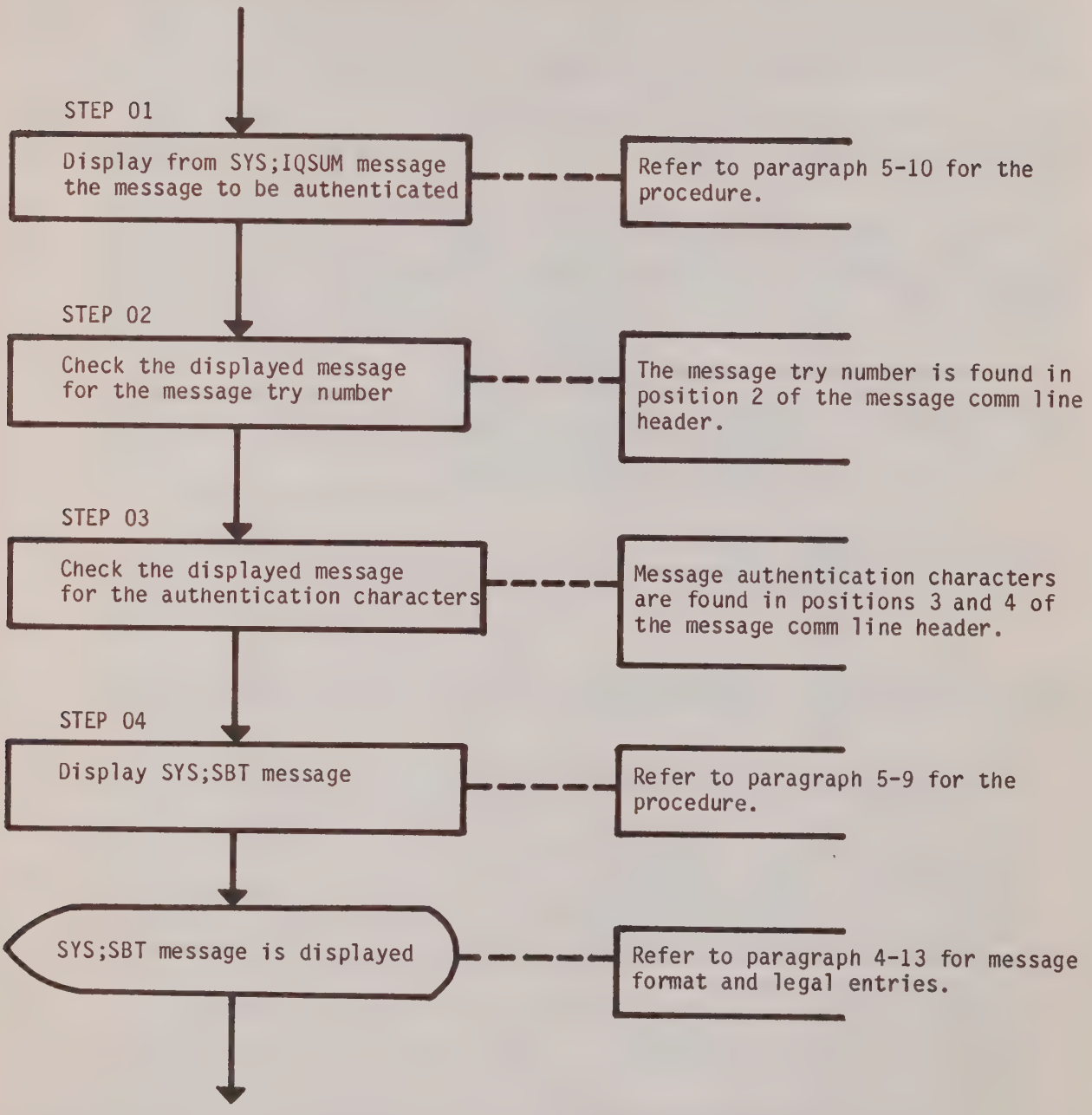
- Manually Authenticate a Received Message.


START
NOTE
When a message is received encrypted, manual authentication is not needed. When an unencrypted message is received, manual authentication procedures are performed. There is never a need to authenticate a message received from a howitzer. Manual authentication is not needed if a message for automatic processing or for relay to another subscriber is received and the AUTH field of the SYS;SETUP message has an entry.

Continued on next page

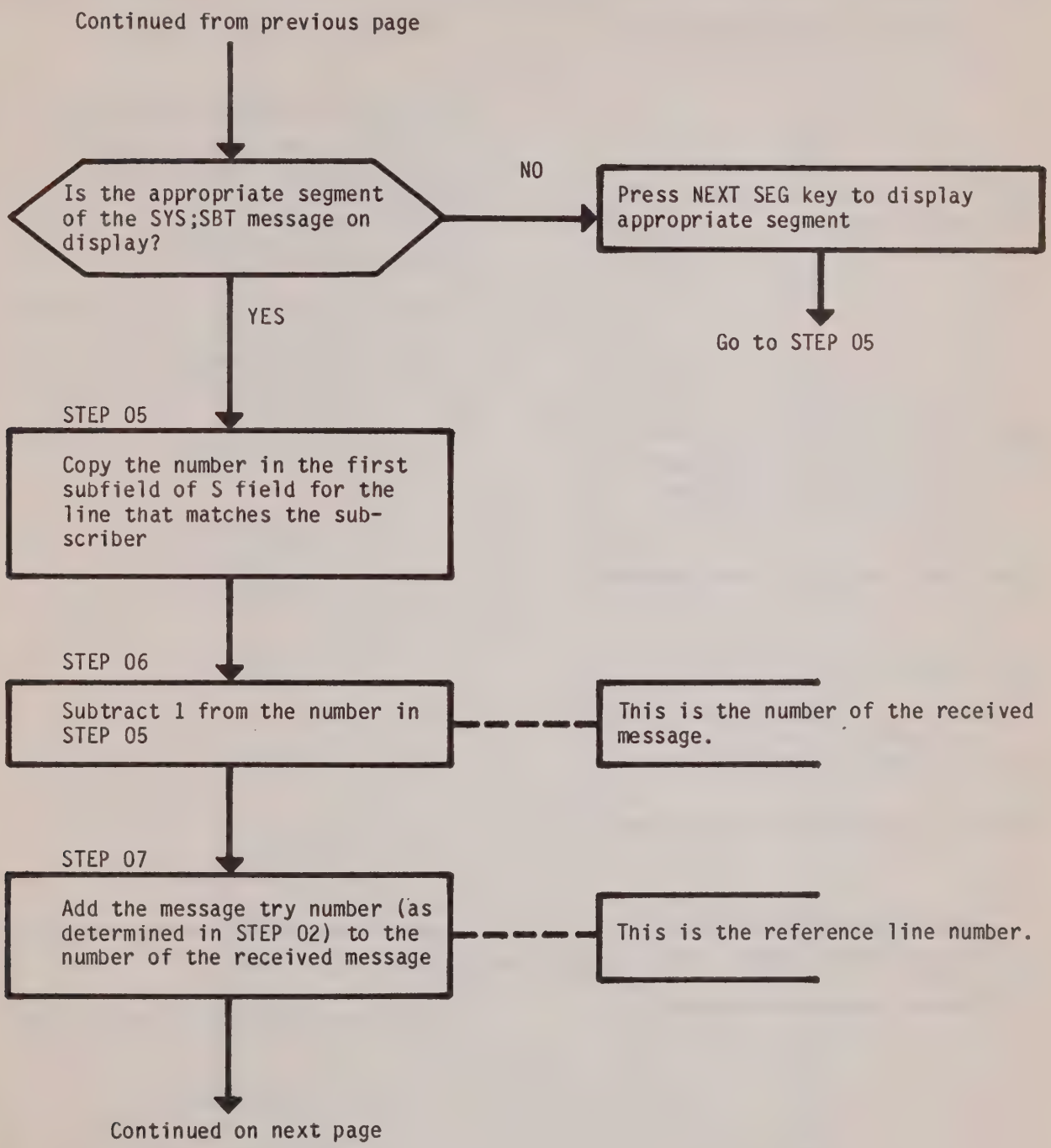
3-22. MANUALLY AUTHENTICATING A RECEIVED MESSAGE - CONTINUED

Continued from previous page

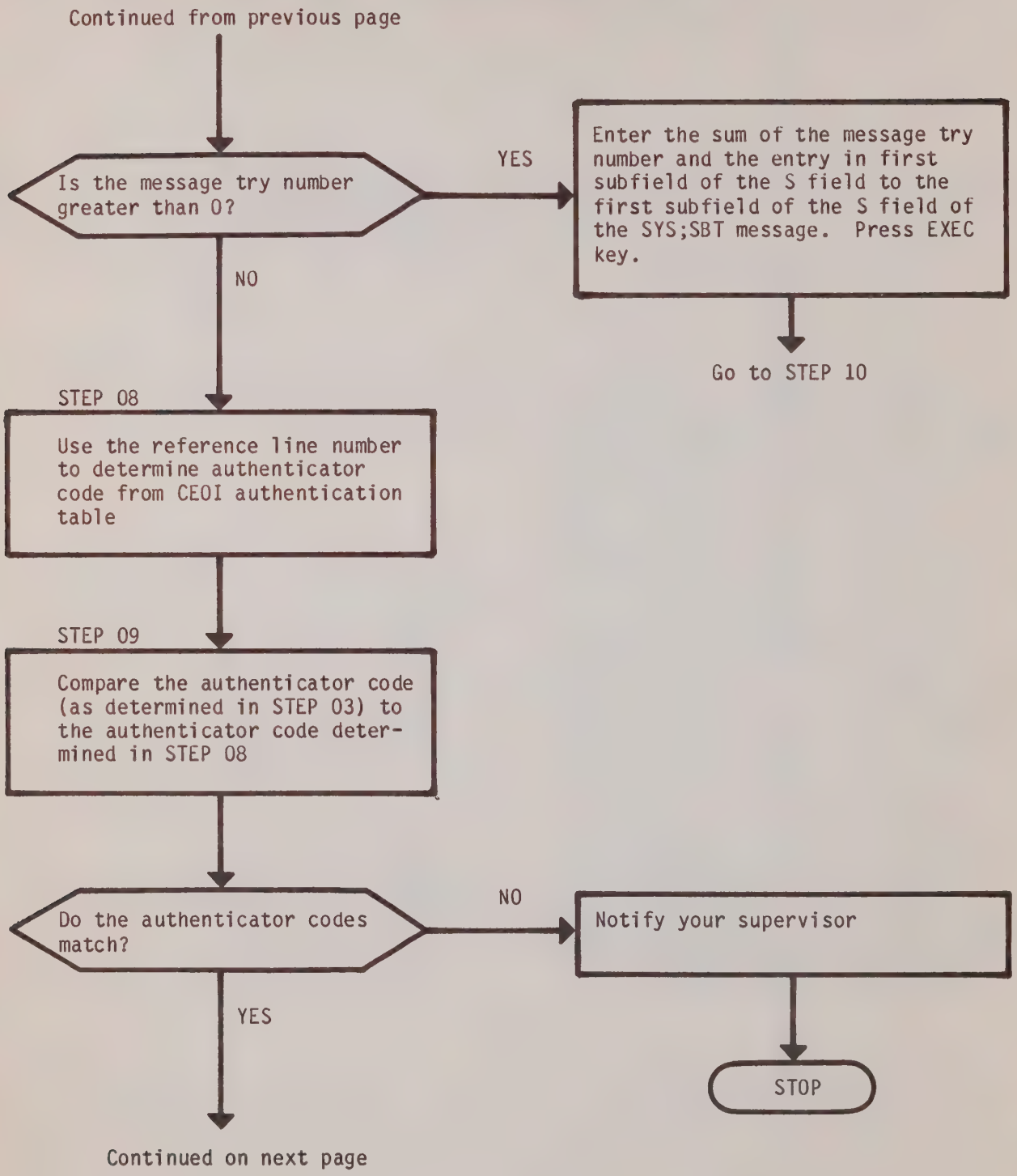

STEP 01
Display from SYS;IQSUM message the message to be authenticated
Refer to paragraph 5-10 for the procedure.
STEP 02
Check the displayed message for the message try number
The message try number is found in position 2 of the message comm line header.
STEP 03
Check the displayed message for the authentication characters
Message authentication characters are found in positions 3 and 4 of the message comm line header.
STEP 04
Display SYS;SBT message
Refer to paragraph 5-9 for the procedure.
SYS;SBT message is displayed
Refer to paragraph 4-13 for message format and legal entries.

Continued on next page

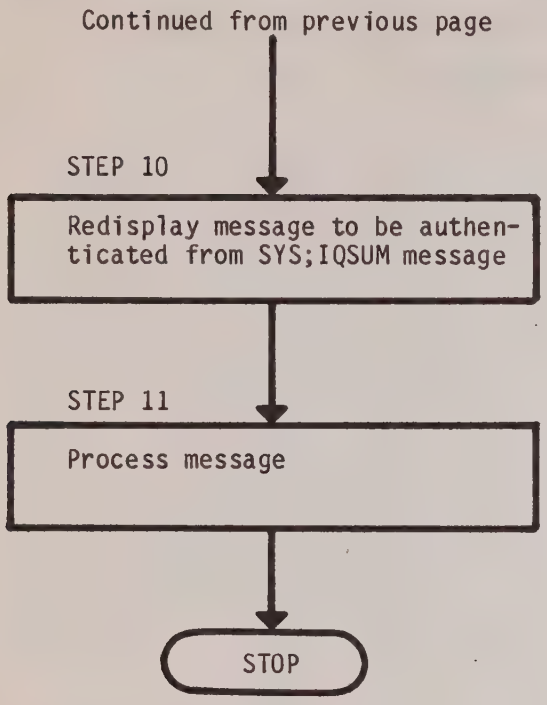
3-22. MANUALLY AUTHENTICATING A RECEIVED MESSAGE - CONTINUED


Continued from previous page
Is the appropriate segment of the SYS;SBT message on display?
NO
Press NEXT SEG key to display appropriate segment
Go to STEP 05
YES
STEP 05
Copy the number in the first subfield of S field for the line that matches the subscriber
STEP 06
Subtract 1 from the number in STEP 05
This is the number of the received message.
STEP 07
Add the message try number (as determined in STEP 02) to the number of the received message
This is the reference line number.
Continued on next page

3-22. MANUALLY AUTHENTICATING A RECEIVED MESSAGE - CONTINUED


Continued from previous page
Is the message try number greater than 0?
YES
Enter the sum of the message try number and the entry in first subfield of the S field to the first subfield of the S field of the SYS;SBT message. Press EXEC key.
Go to STEP 10
NO
STEP 08
Use the reference line number to determine authenticator code from CEOI authentication table
STEP 09
Compare the authenticator code (as determined in STEP 03) to the authenticator code determined in STEP 08
Do the authenticator codes match?
NO
Notify your supervisor
STOP
YES
Continued on next page

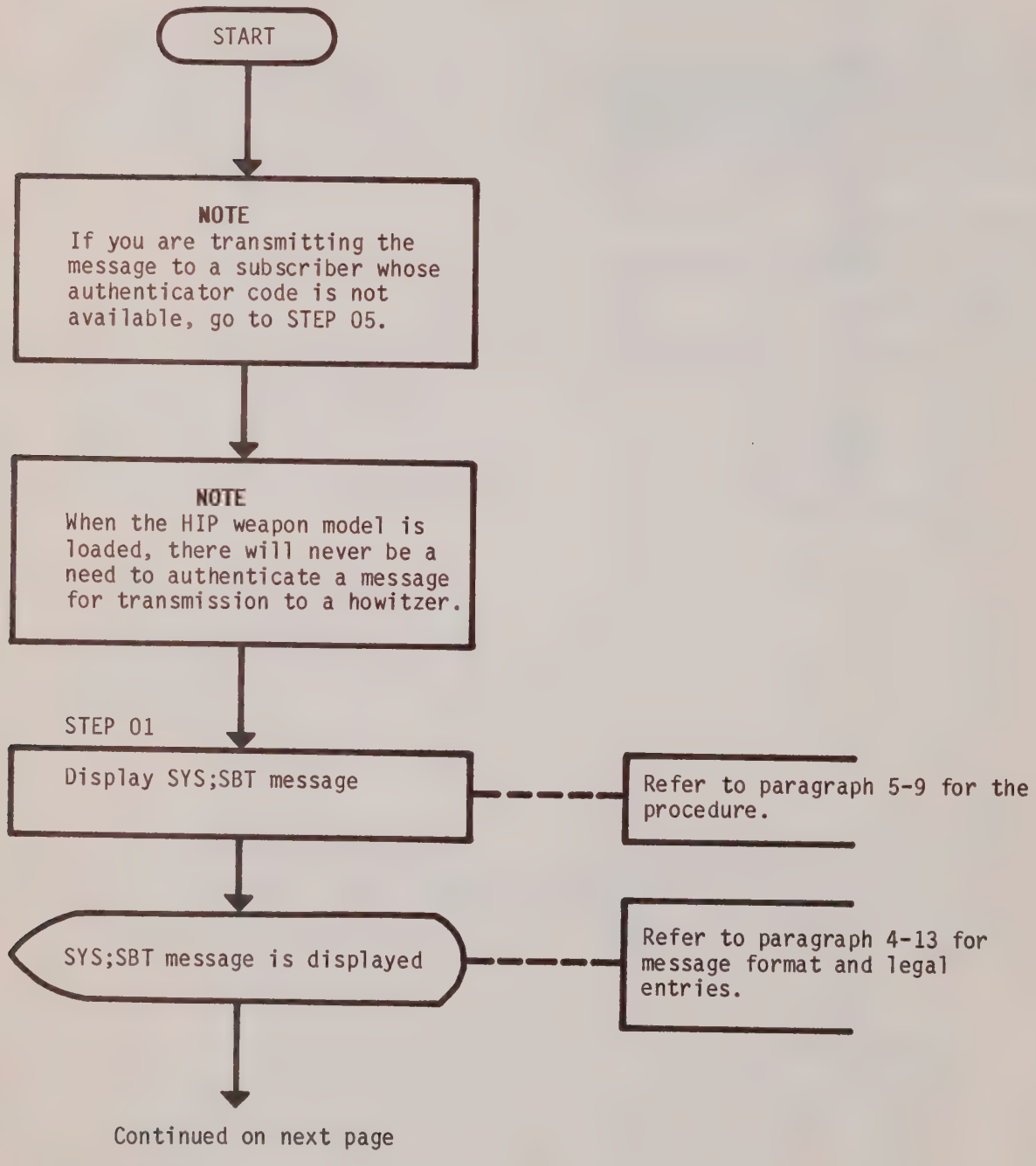
3-22. MANUALLY AUTHENTICATING A RECEIVED MESSAGE - CONTINUED



3-23. MANUALLY AUTHENTICATING A MESSAGE FOR TRANSMISSION

Use this flowchart to perform the following task:

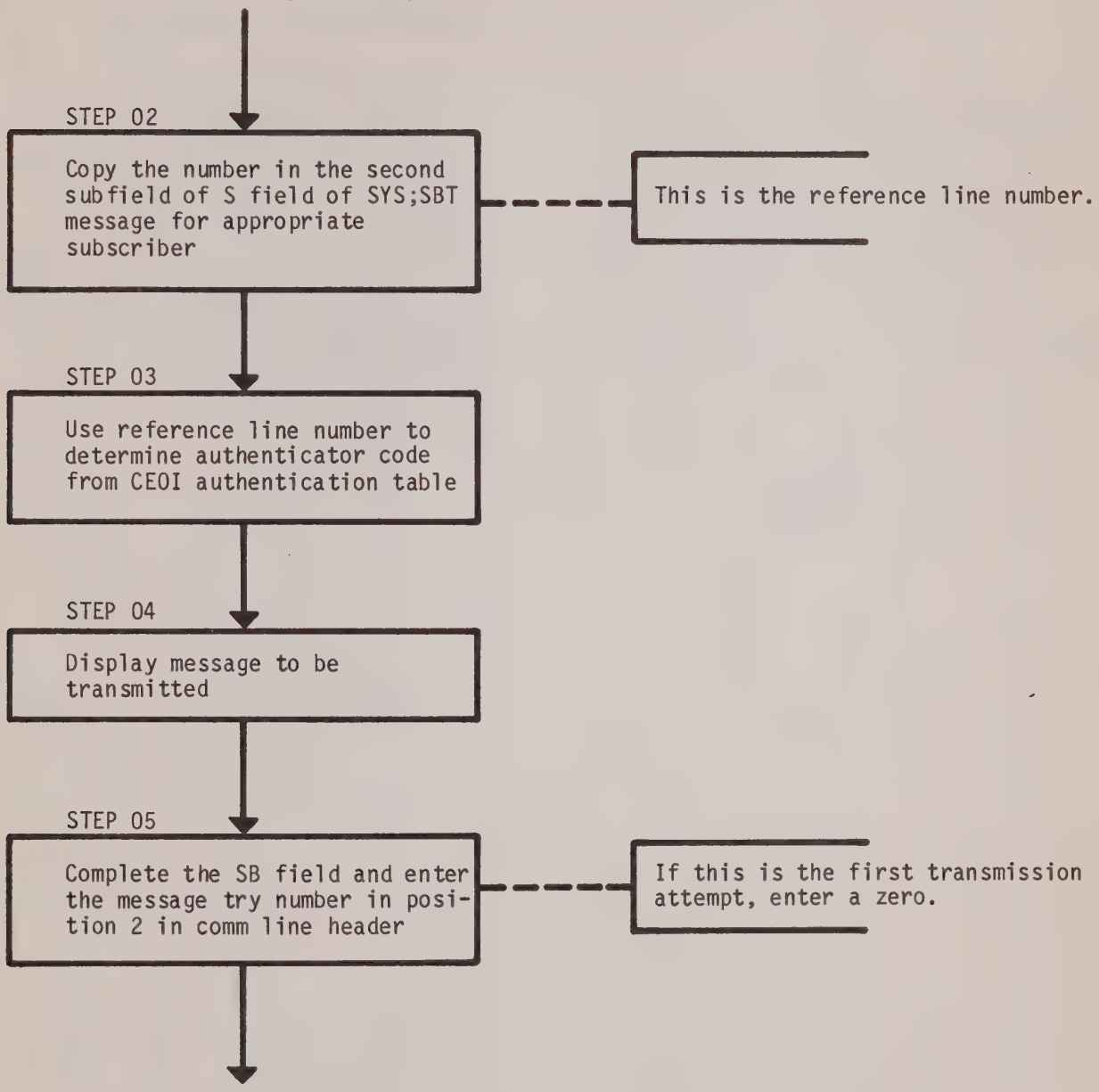
° Manually Authenticate a Message for Transmission.


START
NOTE
If you are transmitting the message to a subscriber whose authenticator code is not available, go to STEP 05.
NOTE
When the HIP weapon model is loaded, there will never be a need to authenticate a message for transmission to a howitzer.
STEP 01
Display SYS;SBT message
Refer to paragraph 5-9 for the procedure.
SYS;SBT message is displayed
Refer to paragraph 4-13 for message format and legal entries.

Continued on next page

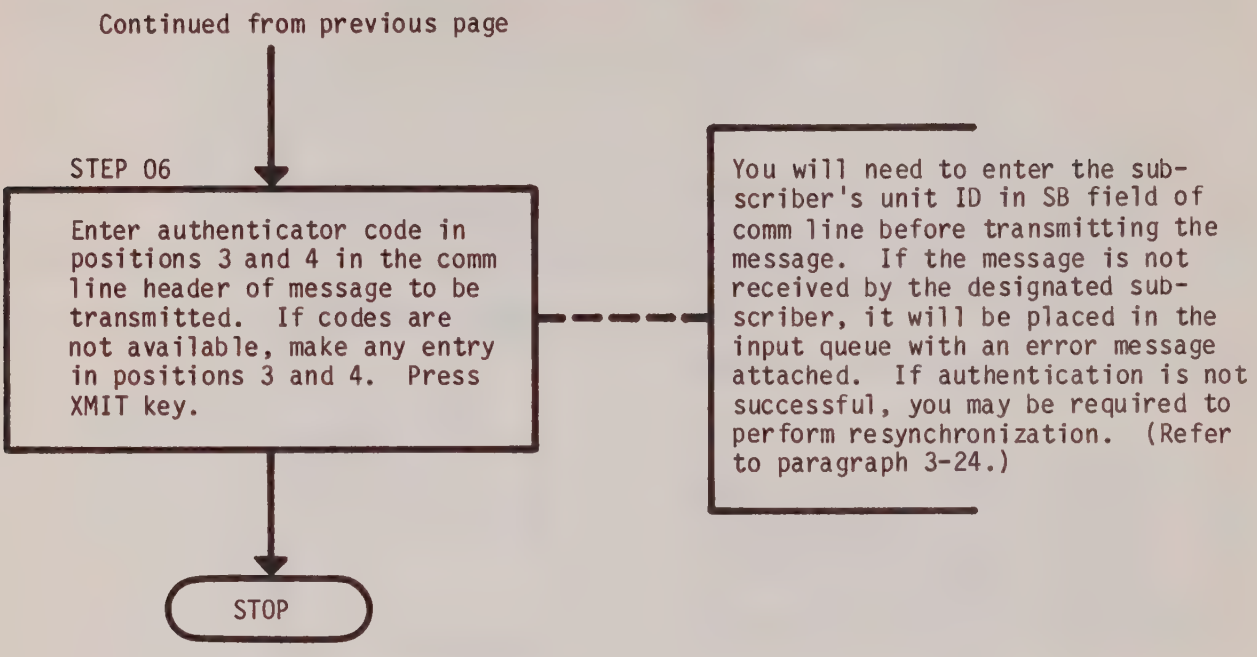
3-23. MANUALLY AUTHENTICATING A MESSAGE FOR TRANSMISSION - CONTINUED

Continued from previous page


STEP 02
Copy the number in the second subfield of S field of SYS;SBT message for appropriate subscriber
This is the reference line number.
STEP 03
Use reference line number to determine authenticator code from CEOI authentication table
STEP 04
Display message to be transmitted
STEP 05
Complete the SB field and enter the message try number in position 2 in comm line header
If this is the first transmission attempt, enter a zero.

Continued on next page

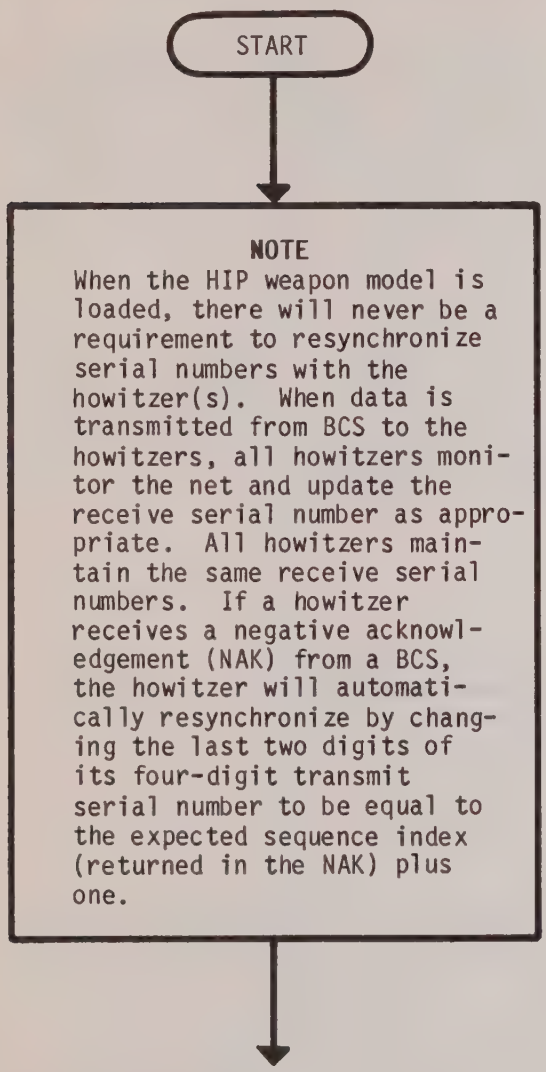
3-23. MANUALLY AUTHENTICATING A MESSAGE FOR TRANSMISSION - CONTINUED


Continued from previous page
STEP 06
Enter authenticator code in positions 3 and 4 in the comm line header of message to be transmitted. If codes are not available, make any entry in positions 3 and 4. Press XMIT key.
You will need to enter the subscriber's unit ID in SB field of comm line before transmitting the message. If the message is not received by the designated subscriber, it will be placed in the input queue with an error message attached. If authentication is not successful, you may be required to perform resynchronization. (Refer to paragraph 3-24.)
STOP

3-24. RESYNCHRONIZING SERIAL NUMBERS

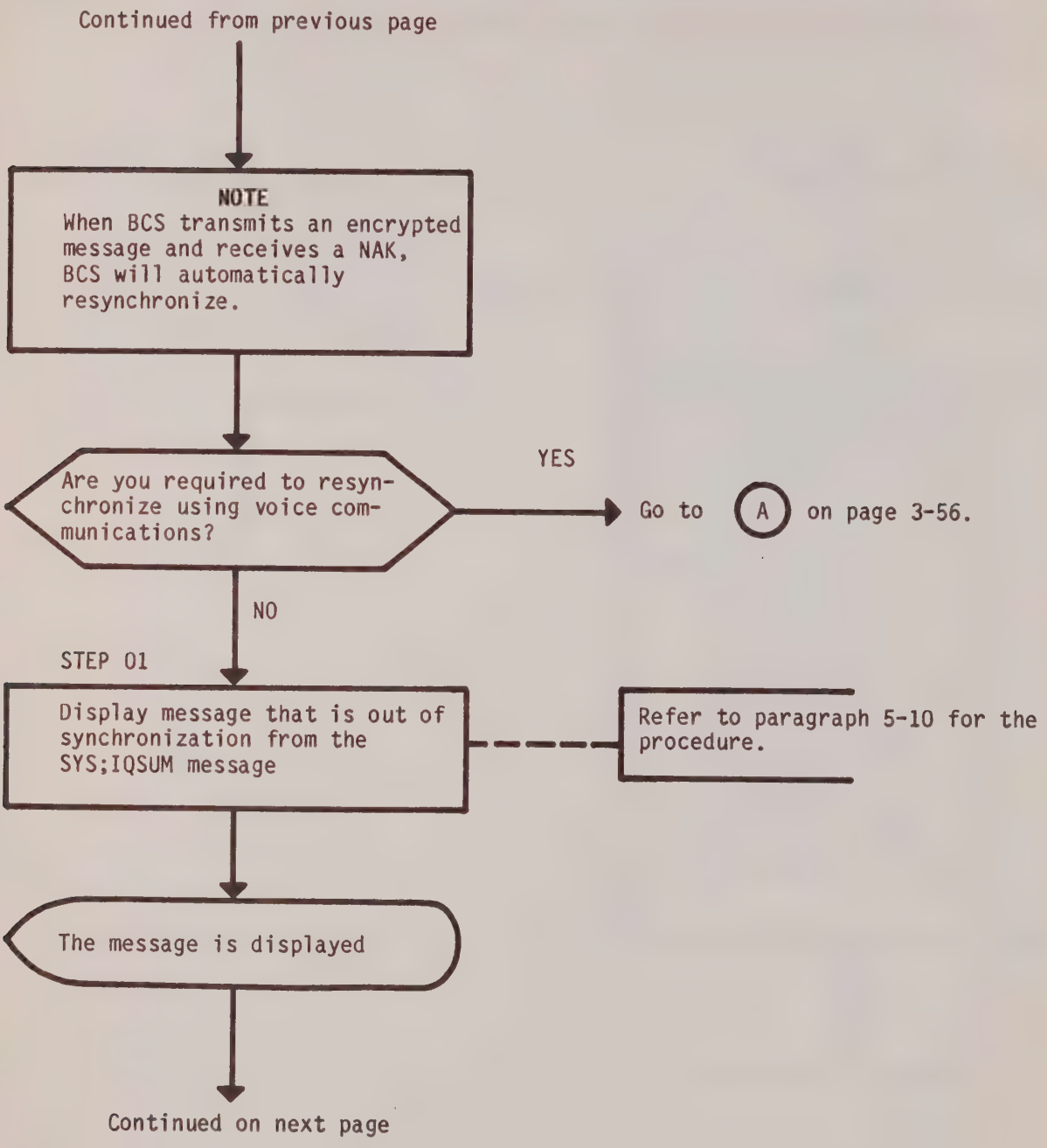
Use this flowchart to perform the following task:

° Resynchronize Serial Numbers.

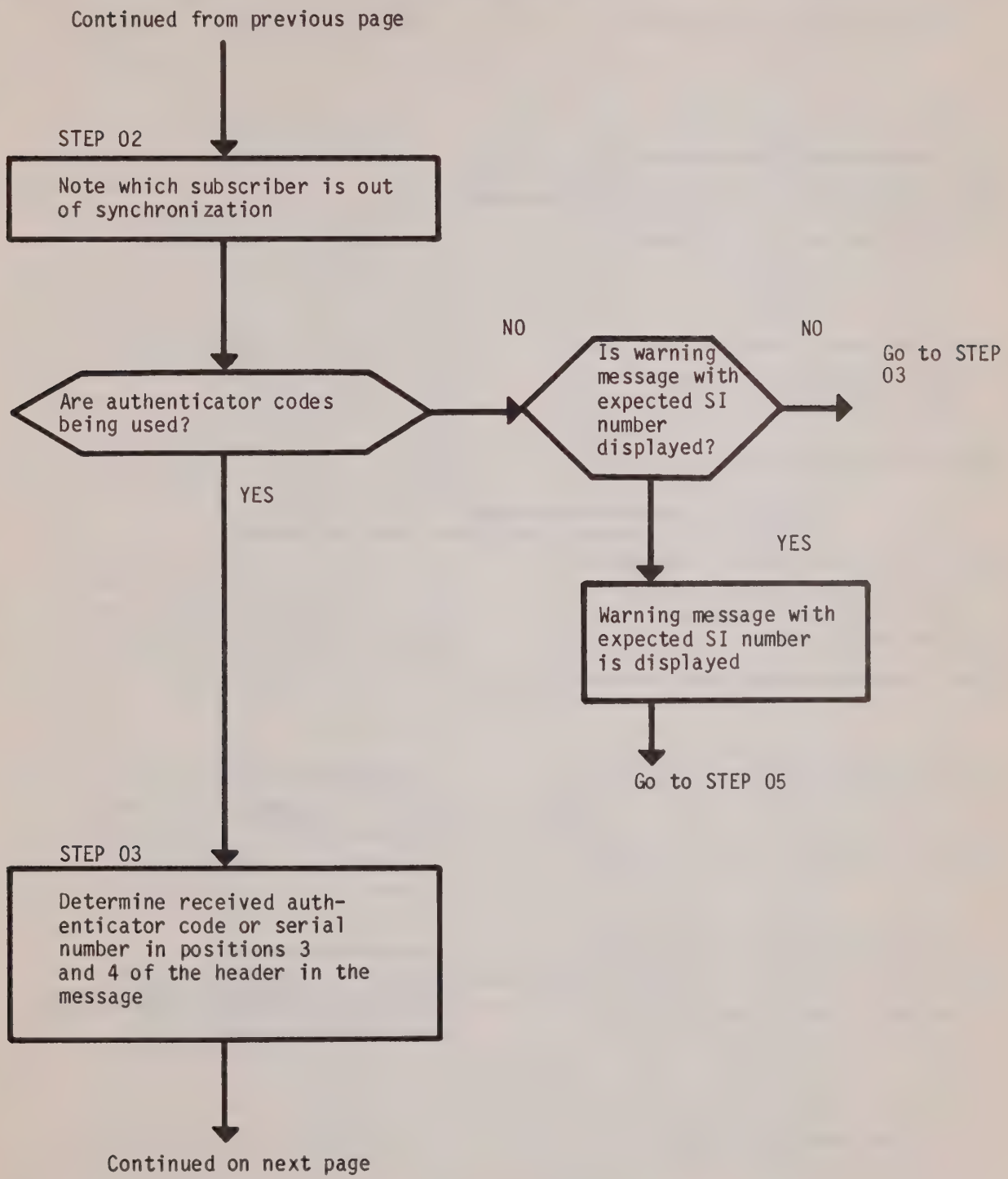

START
NOTE
When the HIP weapon model is loaded, there will never be a requirement to resynchronize serial numbers with the howitzer(s). When data is transmitted from BCS to the howitzers, all howitzers monitor the net and update the receive serial number as appropriate. All howitzers maintain the same receive serial numbers. If a howitzer receives a negative acknowledgement (NAK) from a BCS, the howitzer will automatically resynchronize by changing the last two digits of its four-digit transmit serial number to be equal to the expected sequence index (returned in the NAK) plus one.

Continued on next page

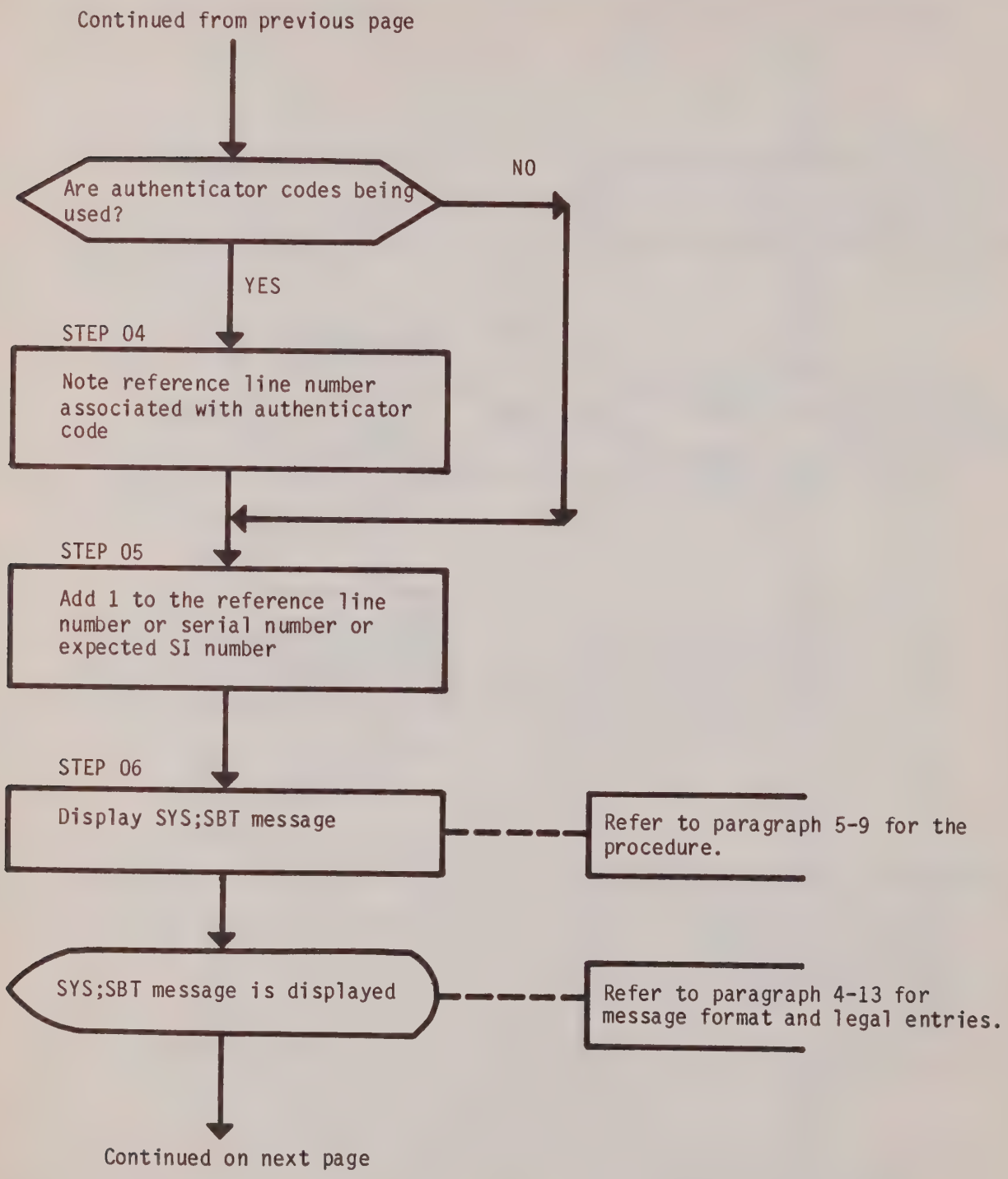
3-24. RESYNCHRONIZING SERIAL NUMBERS - CONTINUED


Continued from previous page
NOTE
When BCS transmits an encrypted message and receives a NAK, BCS will automatically resynchronize.
Are you required to resynchronize using voice communications?
YES
Go to (A) on page 3-56.
NO
STEP 01
Display message that is out of synchronization from the SYS;IQSUM message
Refer to paragraph 5-10 for the procedure.
The message is displayed
Continued on next page

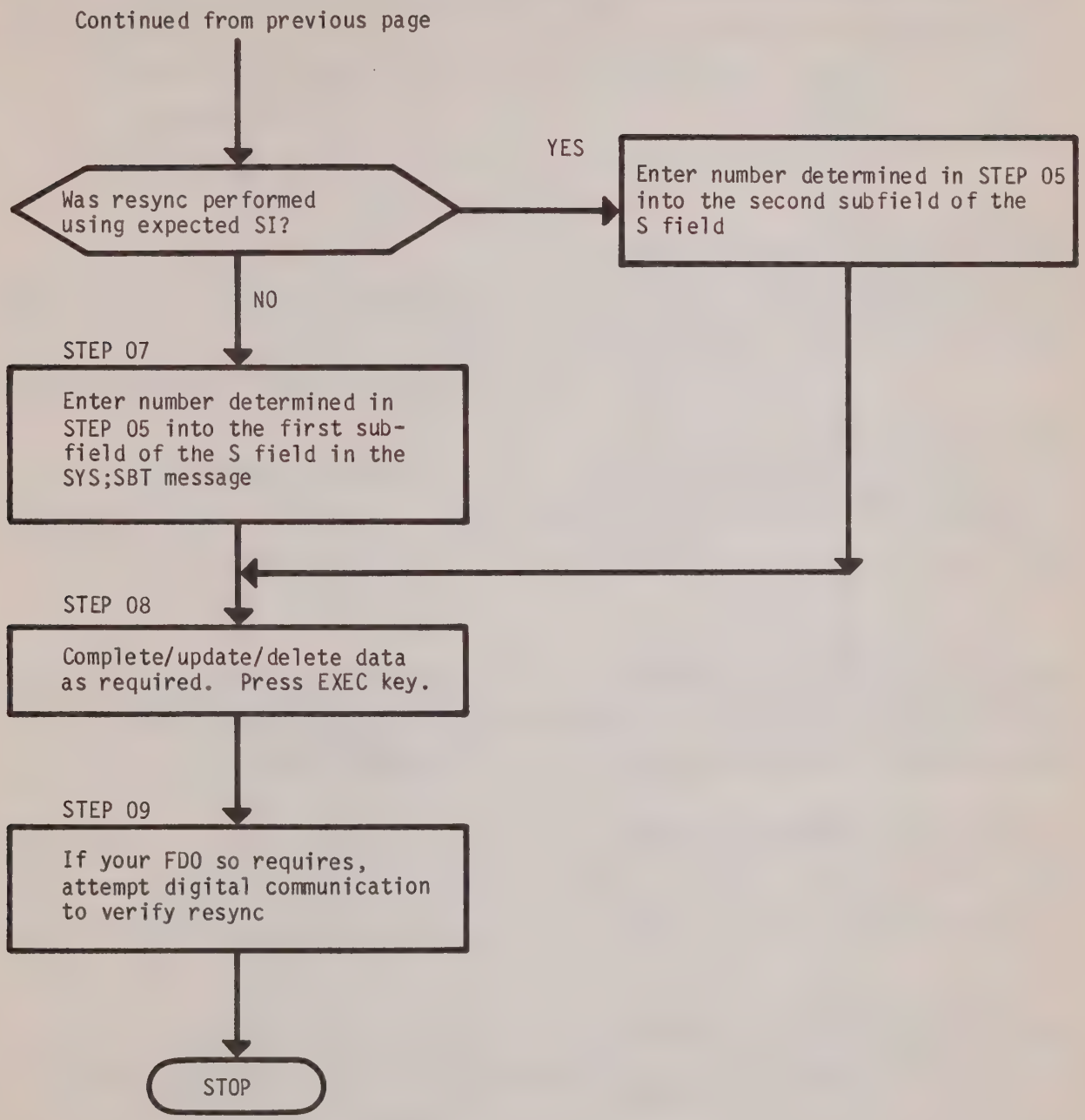
3-24. RESYNCHRONIZING SERIAL NUMBERS - CONTINUED


Continued from previous page
STEP 02
Note which subscriber is out of synchronization
Are authenticator codes being used?
NO
Is warning message with expected SI number displayed?
NO
Go to STEP 03
YES
YES
Warning message with expected SI number is displayed
Go to STEP 05
STEP 03
Determine received authenticator code or serial number in positions 3 and 4 of the header in the message
Continued on next page

3-24. RESYNCHRONIZING SERIAL NUMBERS - CONTINUED

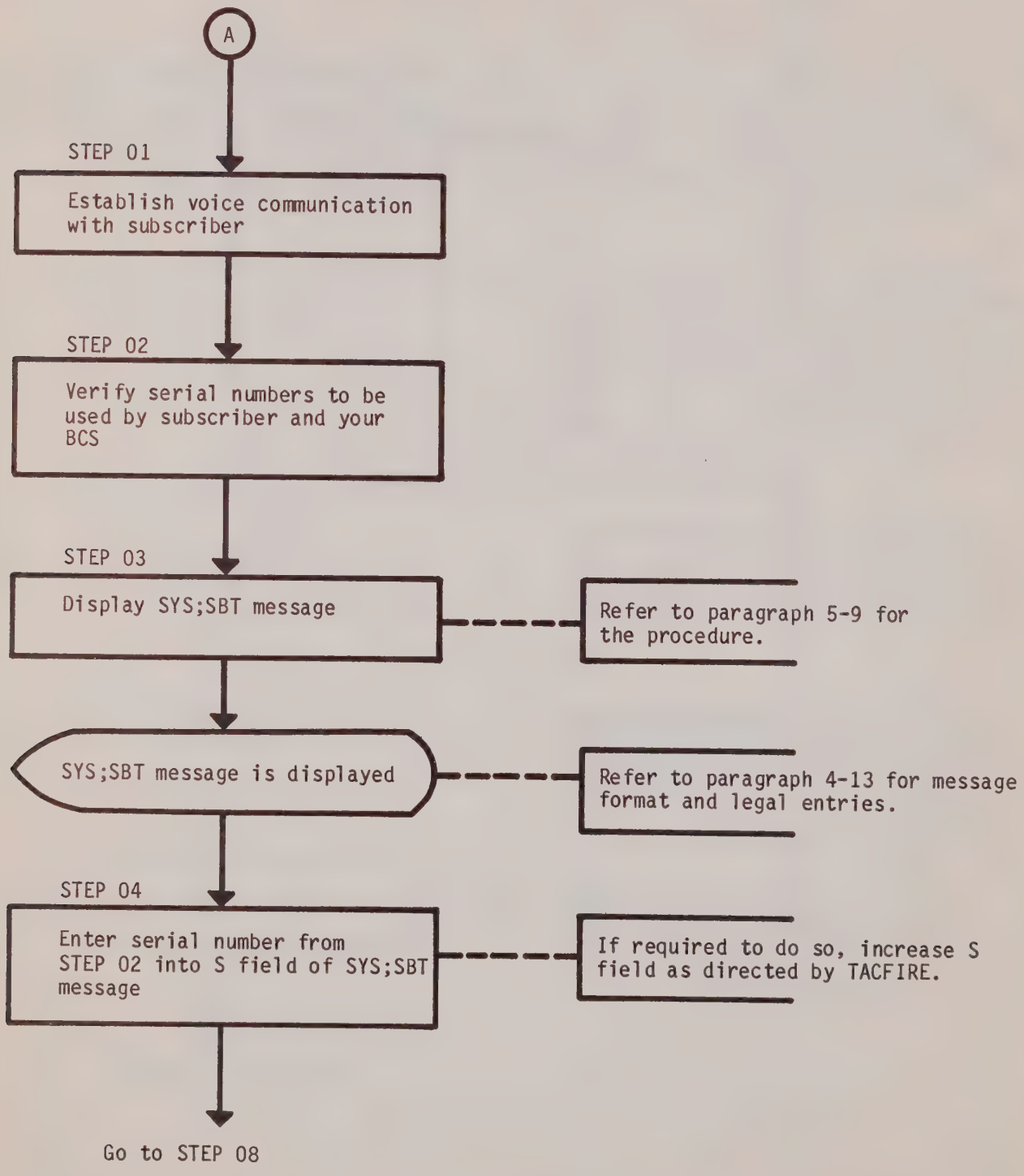

Continued from previous page
Are authenticator codes being used?
NO
YES
STEP 04
Note reference line number associated with authenticator code
STEP 05
Add 1 to the reference line number or serial number or expected SI number
STEP 06
Display SYS;SBT message
Refer to paragraph 5-9 for the procedure.
SYS;SBT message is displayed
Refer to paragraph 4-13 for message format and legal entries.
Continued on next page

3-24. RESYNCHRONIZING SERIAL NUMBERS - CONTINUED


Continued from previous page
Was resync performed using expected SI?
YES
Enter number determined in STEP 05 into the second subfield of the S field
NO
STEP 07
Enter number determined in STEP 05 into the first subfield of the S field in the SYS;SBT message
STEP 08
Complete/update/delete data as required. Press EXEC key.
STEP 09
If your FDO so requires, attempt digital communication to verify resync
STOP

3-24. RESYNCHRONIZING SERIAL NUMBERS - CONTINUED

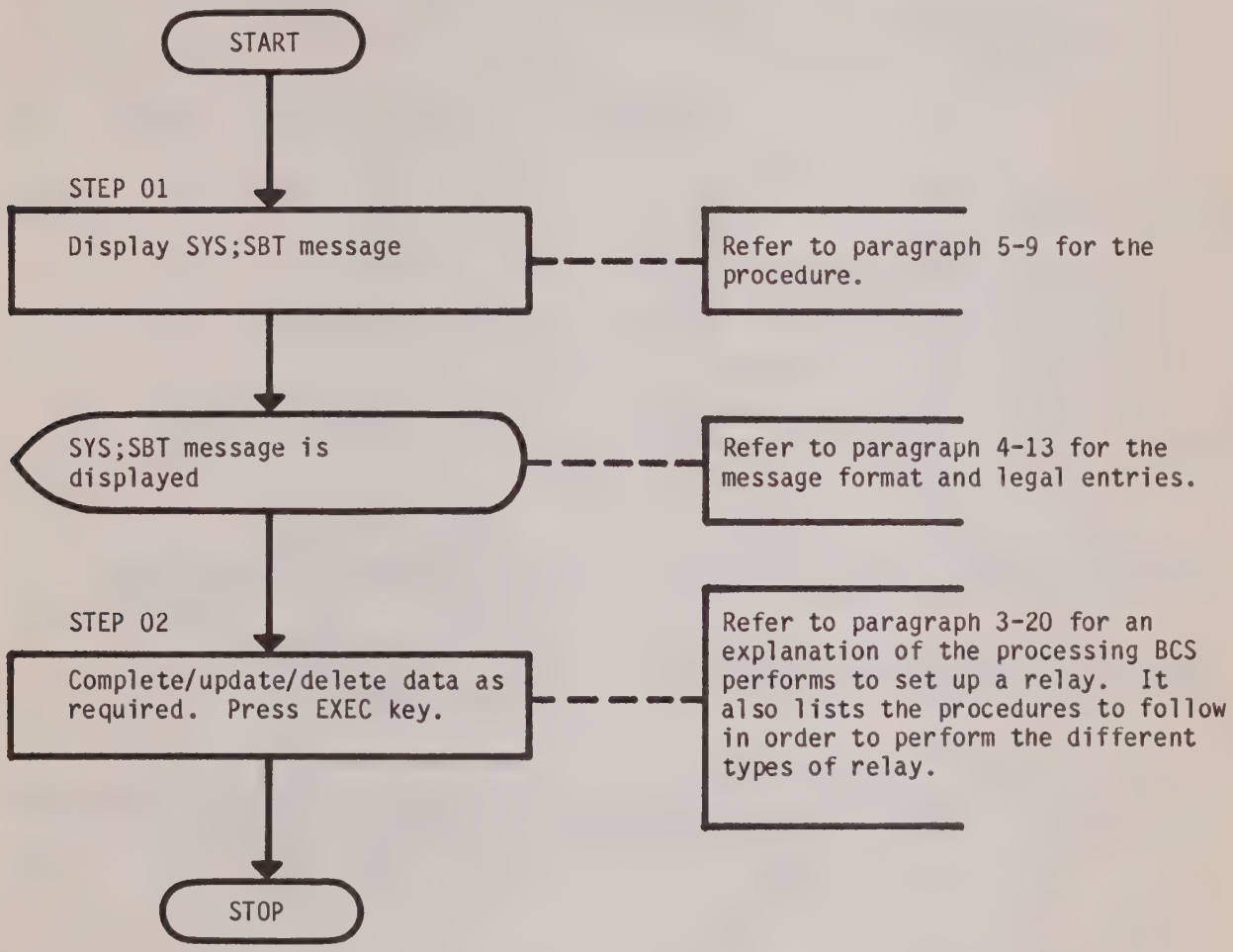
Continued from previous page


A
STEP 01
Establish voice communication with subscriber
STEP 02
Verify serial numbers to be used by subscriber and your BCS
STEP 03
Display SYS;SBT message
Refer to paragraph 5-9 for the procedure.
SYS;SBT message is displayed
Refer to paragraph 4-13 for message format and legal entries.
STEP 04
Enter serial number from STEP 02 into S field of SYS;SBT message
If required to do so, increase S field as directed by TACFIRE.
Go to STEP 08

3-25. ESTABLISHING RELAY CAPABILITY USING THE SYS;SBT MESSAGE

Use this flowchart to perform the following task:

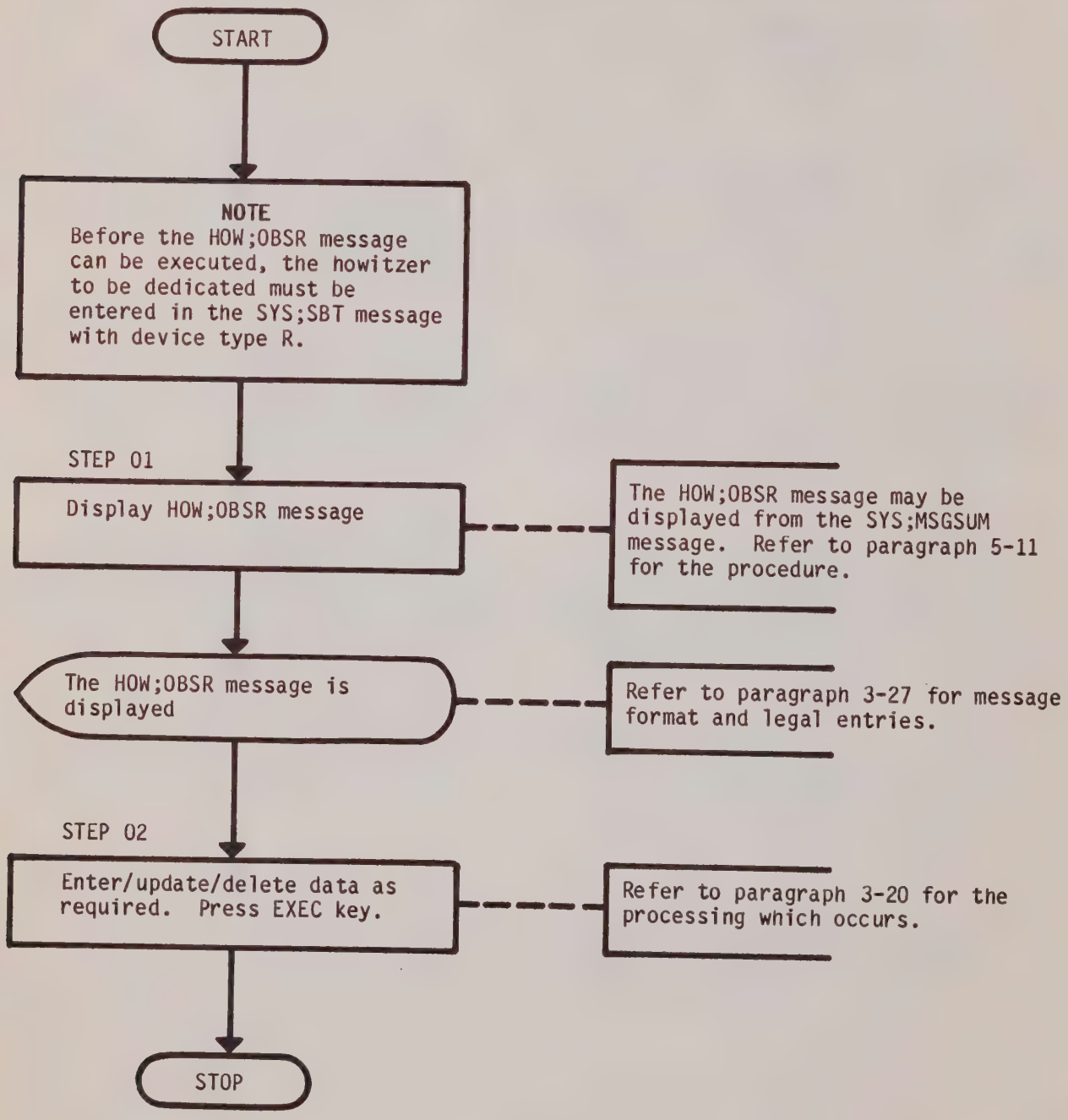
- Establish Relay Capability Using the SYS;SBT Message.


START
STEP 01
Display SYS;SBT message
Refer to paragraph 5-9 for the procedure.
SYS;SBT message is displayed
Refer to paragraph 4-13 for the message format and legal entries.
STEP 02
Complete/update/delete data as required. Press EXEC key.
Refer to paragraph 3-20 for an explanation of the processing BCS performs to set up a relay. It also lists the procedures to follow in order to perform the different types of relay.
STOP

3-26. DEDICATING A HOWITZER TO AN OBSERVER USING THE HOW;OBSR MESSAGE (HIP)

Use this flowchart to perform the following task:

- Dedicate a Howitzer to an Observer Using the HOW;OBSR Message (HIP).


START
NOTE
Before the HOW;OBSR message can be executed, the howitzer to be dedicated must be entered in the SYS;SBT message with device type R.
STEP 01
Display HOW;OBSR message
The HOW;OBSR message may be displayed from the SYS;MSGSUM message. Refer to paragraph 5-11 for the procedure.
The HOW;OBSR message is displayed
Refer to paragraph 3-27 for message format and legal entries.
STEP 02
Enter/update/delete data as required. Press EXEC key.
Refer to paragraph 3-20 for the processing which occurs.
STOP

Section V. MESSAGE PROCESSING MESSAGE FORMATS

SECTION CONTENTS	PARA	PAGE
HOWITZER DEDICATION MESSAGE (HOW;OBSR) (HIP)	3-27	3-59
FIXED FORMAT RELAY MESSAGE (SYS;DMDRLY)	3-28	3-66

3-27. HOWITZER DEDICATION MESSAGE (HOW;OBSR) (HIP)

a. Purpose. The HOW;OBSR message is used to dedicate a howitzer to an observer.

b. Source. The HOW;OBSR message is displayed from the SYS;MSGSUM message.

c. Input. Information establishing a link or relay between a howitzer and an observer is input into the HOW;OBSR message.

d. Computer Processing. When you press the EXEC key, BCS performs automatic processing to establish a full relay, a half-relay, or a link between the howitzer and the observer. Refer to paragraph 3-21 for specific information concerning the computer processing which takes place upon execution of a HOW;OBSR message.

e. Output. If the howitzer is not involved in an active mission, the POLL/READY line of the middle plasma display for the appropriate howitzer will be updated to L or R.

f. Message Format and Legal Entries. The following HOW;OBSR message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;OBSR:FU:_/_/_/__/___;L:_/_/_/__/___;CLDHT:___;GLLDCO:___;VISIB:__;
TDTG:__/__/__;RESTR:_____;TGTNO:_____/____;
SHAJ:____;FZE:____;RD:__;SHEF:____/____;FZ:____/____;RDS:__/__
```

HOW;OBSR;	FU:_/_/_/__/___;L:_/_/_/__/___;CLDHT:___;GLLDCO:___;VISIB:__;

HOW;OBSR identifies the message as the howitzer dedication message.

3-27. HOWITZER DEDICATION MESSAGE (HOW;OBSR) (HIP) - CONTINUED

HOW;OBSR; | FU:_/_/_/__/___; | L:_/_/_/__/___;CLDHT:___;GLLDCO:___;VISIB:__;

FU specifies the logical name of the howitzer to be dedicated. This is a required entry. Legal entries are:

| FU:_/ | _/_/__/___;	Gun number	1 to 4
FU:_/ | _/ | _/__/___;	Platoon	1 or 2
FU:_/_/ | _/ | __/___;	Battery	A to Z
FU:_/_/_/ | __/ | ___;	Battalion	1 to 99
FU:_/_/_/__/ | ___; |	Regiment	1 to 999

HOW;OBSR;FU:_/_/_/__/___; | L:_/_/_/__/___; | CLDHT:___;GLLDCO:___;VISIB:__;

L specifies the observer to which the howitzer is to be dedicated. This is a required entry. Legal entries are:

| L:_/ | _/_/__/___;	Section	One alphabetic or numeric character
L:_/ | _/ | _/__/___;	Platoon	One alphabetic or numeric character
L:_/_/ | _/ | __/___;	Battery	One alphabetic or numeric character
L:_/_/_/ | __/ | ___;	Battalion	One or two alphabetic or numeric characters
L:_/_/_/__/ | ___; |	Regiment	One to three alphabetic or numeric characters

3-27. HOWITZER DEDICATION MESSAGE (HOW;OBSR) (HIP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;OBSR;FU:_/_/_/__/___;L:_/_/_/__/___;CLDHT:___;GLLDCO:___;VISIB:__;
TDTG:__/__/__;RESTR:_____;TGTNO:_____/____;
SHAJ:____;FZE:____;RD:__;SHEF:____/____;FZ:____/____;RDS:__/__
```

HOW;OBSR;FU:_/_/_/__/___;L:_/_/_/__/___; **CLDHT:___;** GLLDCO:___;VISIB:__;

CLDHT indicates the cloud height in tens of meters. This is an optional entry. Legal entries are 0 to 999.

HOW;OBSR;FU:_/_/_/__/___;L:_/_/_/__/___;CLDHT:___; **GLLDCO:___;** VISIB:__;

GLLDCO indicates the observer's ground laser locator designator code. This is an optional entry. Legal entries are 111 to 888.

HOW;OBSR;FU:_/_/_/__/___;L:_/_/_/__/___;CLDHT:___;GLLDCO:___; **VISIB:__;**

VISIB indicates the observer's visibility. This is an optional entry. Legal entries are:

```
 3 -  30 percent visibility (2000 meters to 4000 meters)
 5 -  50 percent visibility (4000 meters to 7500 meters)
10 - 100 percent visibility (7500 meters or more)
```

TDTG:__/__/__; RESTR:_____;TGTNO:_____/____;

TDTG indicates the date and time to terminate the dedication. This is an optional entry. Legal entries are:

TDTG:__/ __/__;	Day	1 to 31
TDTG:__/ **__/** __;	Hour	00 to 23
TDTG:__/__/ **__;**	Minute	00 to 59

3-27. HOWITZER DEDICATION MESSAGE (HOW;OBSR) (HIP) - CONTINUED

TDTG:__/__/__; **RESTR:_____;** TGTNO:_____/____;

RESTR indicates the dedication restrictions. This is an optional entry. Legal entries are:

FM - Fire mission (the observer may only request fire mission information from the howitzer)
FMTGT - Fire mission and target file (the observer may request fire mission or target file information from the howitzer)
ALL - No restrictions

Default = FM

TDTG:__/__/__;RESTR:_____; **TGTNO:_____/____;**

TGTNO indicates the target number block to be used during dedication. An entry in the first subfield is required, but an entry in the second subfield is optional. Legal entries are:

TGTNO:_____/	____;	Initial number	Two letters followed by four numbers
TGTNO:_____/	**____;**	Final number, if any	Four numbers

SHAJ:____; FZE:____;RD:__;SHEF:____/____;FZ:____/____;RDS:__/__

SHAJ indicates the shell to be used in adjustment. This is a conditional entry. Make an entry in this field only if you made an entry in FZE and RD. Legal entries are listed in appendix G.

SHAJ:____; **FZE:____;** RD:__;SHEF:____/____;FZ:____/____;RDS:__/__

FZE indicates the fuze used in the adjust phase. This is a conditional entry. Make an entry in this field only if you made an entry in SHAJ and RD. Legal entries are listed in appendix G.

3-27. HOWITZER DEDICATION MESSAGE (HOW;OBSR) (HIP) - CONTINUED

```
_____;P:_;SB:_/_/_/_/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;OBSR;FU:_/_/_/__/___;L:_/_/_/__/___;CLDHT:___;GLLDCO:___;VISIB:__;
TDTG:__/__/__;RESTR:_____;TGTNO:_____/____;
SHAJ:____;FZE:____;RD:__;SHEF:____/____;FZ:____/____;RDS:__/__
```

SHAJ:____;FZE:____; **RD:__;** SHEF:____/____;FZ:____/____;RDS:__/__

RD indicates the number of rounds to be fired in the adjust phase. This is a conditional entry. Make an entry in this field only if you made an entry in SHAJ and FZE. An entry other than zero must exist in this field or in the RDS field. Legal entries are 1 to 99.

SHAJ:____;FZE:____;RD:__; **SHEF:____/____;** FZ:____/____;RDS:__/__

SHEF indicates the shell to be fired in effect. This is a conditional entry. Make an entry in this field only if you made an entry in FZ and RDS. Legal entries are listed in appendix G.

SHEF:____/ ____; Initial volley

SHEF:____/ **____;** Subsequent volleys

SHAJ:____;FZE:____;RD:__;SHEF:____/____; **FZ:____/____;** RDS:__/__

FZ indicates the fuze type to be fired in effect. This is a conditional entry. Make an entry in this field only if you made an entry in SHEF and RDS. Legal shell/fuze combinations are listed in appendix G.

FZ:____/ ____; Initial volley

FZ:____/ **____;** Subsequent volleys

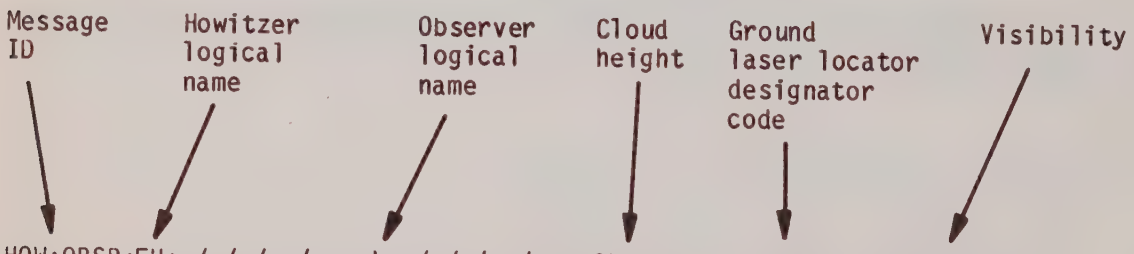
3-27. HOWITZER DEDICATION MESSAGE (HOW;OBSR) (HIP) - CONTINUED

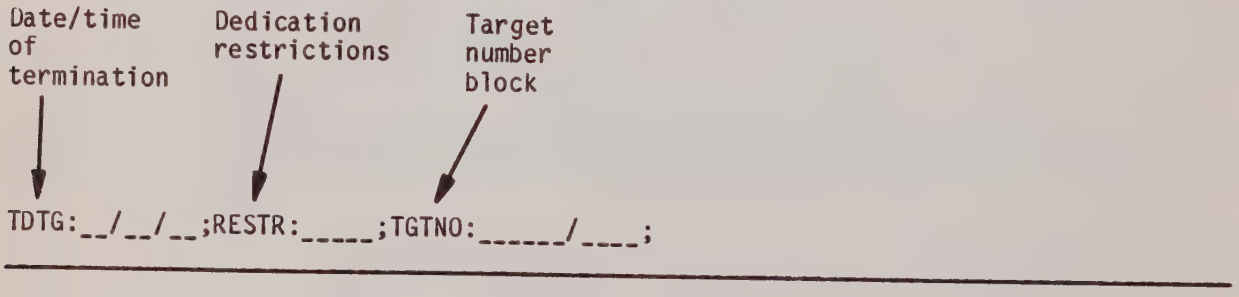
SHAJ:____;FZE:____;RD:__;SHEF:____/____;FZ:____/____; RDS:__/__;

RDS indicates the number of rounds to be fired in effect. This is a conditional entry. Make an entry in this field only if you made an entry in SHEF and FZ. An entry other than zero must exist in this field or in the RD field. Legal entries are:

RDS:__/ __;	Initial volley	1 to 99
RDS:__/ __;	Subsequent volleys	0 to 99

g. Exploded View. Use the following exploded view as a way to review the message.





3-27. HOWITZER DEDICATION MESSAGE (HOW;OBSR) (HIP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;OBSR;FU:_/_/_/__/___;L:_/_/_/__/___;CLDHT:___;GLLDCO:___;VISIB:__;
TDTG:__/__/__;RESTR:_____;TGTNO:_____/____;
SHAJ:____;FZE:____;RD:__;SHEF:____/____;FZ:____/____;RDS:__/__┘
```

```
Shell      Fuze       Rounds     Shell          Fuze          Rounds
in         in         in         in             in            in
adjust-    adjust-    adjust-    effect         effect        effect
ment       ment       ment
  ↓          ↓          ↓          ↓              ↓             ↓
SHAJ:____;FZE:____;RD:__;SHEF:____/____;FZ:____/____;RDS:__/__┘
```

3-28. FIXED FORMAT RELAY MESSAGE (SYS;DMDRLY)

a. Purpose. The SYS;DMDRLY message is used for relaying when a fixed-format message is received by a BCS for relay to another BCS or TACFIRE. It is also used when a BCS is relaying through TACFIRE or another BCS to a fixed-format device.

b. Source. The SYS;DMDRLY message is computer-generated by either the relaying or the originating system.

c. Input. The device type of the fixed-format device and fixed-format data are input into the SYS;DMDRLY message. A compressed fixed-format data string is inserted into the SYS;DMDRLY message. When the BCS receives a fixed-format message and generates a SYS;DMDRLY message, the contents of the received message will be inserted into the DMDA field and the DMDB field if needed.

d. Computer Processing. If the message to be relayed is received as a SYS;DMDRLY message, the message will be converted to a fixed-format message. The SYS;DMDRLY message will be placed in the input queue for manual authentication. If manual authentication is required and the destination subscriber is a fixed-format device, the original message you transmitted, not the SYS;DMDRLY message, will be posted in the input queue for manual authentication.

e. Output. When the message to be relayed is received as a SYS;DMDRLY message, it will be converted to a fixed-format message.

f. Message Format and Legal Entries. The following SYS;DMDRLY message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SYS;DMDRLY;DV:_;
DMDA:_____;
DMDB:_____;
```

SYS;DMDRLY;	DV:_;

SYS;DMDRLY identifies the message as the fixed format relay message.

3-28. FIXED FORMAT RELAY MESSAGE (SYS;DMDRLY) - CONTINUED

SYS;DMDRLY; **DV:_;**

DV specifies the device type of the fixed-format device. This is a required entry. Legal entries are:

T = TFDMD
Z = FIST DMD
F = Firefinder
A = RPV
S = ATHS

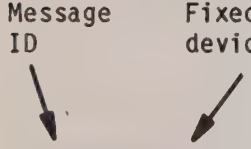
DMDA:_____;

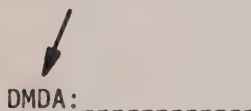
DMDA specifies the fixed-format data string received from or to be sent to the fixed-format device. This is a required entry. The entry is in the form of a plain text message.

DMDB:_____;

DMDB is a continuation of the fixed-format data string received from or to be sent to the fixed-format device. This is an optional entry. The entry is in the form of a plain text message.

g. Exploded View. Use the following exploded view as a way to review the message.





3-28. FIXED FORMAT RELAY MESSAGE (SYS;DMDRLY) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SYS;DMDRLY;DV:_;
DMDA:_____;
DMDB:_____┤
```

Continuation of fixed-format data string

```
DMDB:_____┤
```

CHAPTER 4

SYSTEM INITIALIZATION

OVERVIEW

This chapter describes the procedures used to initialize, shut down, and restart the BCS.

Section I provides general information regarding hardware and software initialization, shutdown, and restart.

Section II provides flowcharts to show you how to turn on and initialize the BCS, how to restart the BCS following power failure, and how to shut down the BCS.

Section III provides specific information about the message formats used during initialization. The message formats are shown as they appear on the lower display of the BCU. An explanation of the mnemonics used and the legal data entries is also provided.

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Section II.	INITIALIZATION FLOWCHARTS	4-5
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Section I. GENERAL INFORMATION

SECTION CONTENTS

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INITIALIZATION PROCEDURES	4-1	4-2
HARDWARE INITIALIZATION	4-2	4-2
SOFTWARE INITIALIZATION	4-3	4-2
SHUTDOWN	4-4	4-4
POWER FAILURE	4-5	4-4

4-1. INITIALIZATION PROCEDURES

Initialization is the procedure used to prepare the BCS hardware and software for operation. Initialization procedures consist of:

- turning on all BCS hardware
- loading the software program
- entering initialization data into the computer.

4-2. HARDWARE INITIALIZATION

The BCS hardware consists of the BCU (computer), PDU, radios, printer, and COMSEC equipment. Simplified procedures to initialize or turn on the BCS hardware are provided as a part of the flowcharts in section II of this chapter. These flowcharts do not show you all the steps necessary to assemble, adjust, or maintain the BCS equipment. (Refer to the TM's listed in paragraph 1-1 for information on those subjects.) The purpose of the initialization flowchart is to give you a logical place to start when turning on your BCS. The shutdown and restart procedures are also shown in simplified form to give you a quick reference for these routine operations.

4-3. SOFTWARE INITIALIZATION

The process of entering the data needed to operate the BCS is called software initialization. You enter this data after the equipment has been turned on.

a. Loading the Software Program. The first series of steps for software initialization involves loading the software program into the memory of the BCS. The software program has been recorded on the tape in the Tape Transport Unit (TTU). During loading of the software program, the data on the tape is transferred to the memory of the computer. It is used to control the internal functions of the computer. In order to load the software program, you must first insert the TTU into the Program Load Unit (PLU) of the BCU.

The software program is divided into two parts. The two parts are the weapon-independent program and the weapon-dependent program. The weapon-independent program is the part of the software program used by the BCS no matter which weapon model you are using. You load it into the memory of the BCS by pressing the LOAD PLU button. The SYS;TESTS message is displayed. The weapon-independent program has been loaded. If you wish to perform diagnostic tests, you must do so at this time. (Refer to chapter 8 for the procedure.) The SELECT field will be displayed with a 7 in it for exiting diagnostics. If you do not wish to perform diagnostic tests, press the EXEC key to exit diagnostics. (Once diagnostics is exited, you must reload the system in order to perform them again.) The SYS;WEAPONS message is displayed. The weapon-dependent program contains the part of the software program which varies depending on the weapon model you are using. In order to load the weapon-dependent program, select a weapon model or a previously recorded data base from the SYS;WEAPONS message and press the EXEC key. When the SYS;SETUP message is displayed, the weapon-dependent program has been loaded into the memory of the BCS.

b. Entering Initialization Data. The computer is then ready to receive the initialization data. This data is taken from your Operation Order (OPORD), unit

4-3. SOFTWARE INITIALIZATION - CONTINUED

Standing Operating Procedures (SOP's), Communication Electronics Operating Instructions (CEOI's), Communication Electronics Standing Instructions (CESI's), map of the operational area, and other sources. The BCS will not correctly send, receive, or process messages unless the initialization data is correct and current.

(1) Initialization with a Non-HIP Weapon Model Selection. When you select a non-HIP weapon model from the SYS;WEAPONS message, a sequence of seven initialization messages will be displayed. These messages are:

- SYS;SETUP - provides initialization instructions to prepare the computer for operation
- SYS;COMM - establishes the communication characteristics for each comm channel
- SYS;SBT - establishes which subscribers can legally send messages to you and receive messages from you
- SPRT;MAP - defines your area of operations
- AFU;UPDATE - provides the fire unit data required in fire mission processing
- BCS;PIECES - establishes the locations, grouping, and status of the howitzers
- AFU;BAMOUP - provides information regarding ammunition available at the fire unit.

You must execute the first two messages in this sequence.

(2) Initialization with a HIP Weapon Model Selection. If you choose the HIP weapon model (index number 3) from the SYS;WEAPONS message, a sequence of six initialization messages will be displayed. These messages are:

- SYS;SETUP - provides initialization instructions to prepare the computer for operation
- SYS;COMM - establishes the communication characteristics for each comm channel
- SYS;SBT - establishes which subscribers can legally send messages to you and receive messages from you
- HOW;SBT - establishes a separate subscriber record for each howitzer you entered in the SYS;SBT message
- SPRT;MAP - defines your area of operations
- AFU;UPDATE - provides the fire unit data required in fire mission processing.

4-3. SOFTWARE INITIALIZATION - CONTINUED

You must execute the first two messages in this sequence. The BCS will ignore any special action key (except EXEC) until these messages are executed.

(3) Initialization with a Previously Recorded Data Base. When a previously recorded data base (12 or 13) is selected from the SYS;WEAPONS message, a sequence of three initialization messages will be displayed. These messages are:

- SYS;SETUP
- SYS;COMM
- SYS;SBT.

If the data in any of these messages does not need to be changed, you may press the NEXT SEG key to display the next message in the sequence. Pressing the INDEX key will terminate the sequence and the SYS;INDEX message is displayed. Refer to paragraph 6-25 for the procedure to update initialization data.

Detailed information concerning initialization and these messages is provided in sections II and III of this chapter.

4-4. SHUTDOWN

When the BCS is shut down, the initialization data and data base will be erased or lost from the memory of the computer. If you want to restart the computer at a later time using the same initialization data and data base, you must record it before you shut down the BCS. Refer to paragraph 4-7 for shutdown procedures.

4-5. POWER FAILURE

Power failure means that the primary source of power is no longer supplying power to the BCS. When primary power is lost:

- Keyboard lockout occurs.
- All processing halts and the message or data being processed is lost.
- All messages being received are lost in part or in whole.
- All messages that were in the output buffer waiting to be transmitted are placed in the input queue with a warning message attached if battery backup is available. Otherwise, the messages are lost.
- The data stored in the memory of the BCS is lost unless the backup batteries in the PDU supplied power or the data has been previously recorded on the tape in the TTU.

You must restart the BCS and attempt to recover lost data when power failure occurs. Refer to paragraph 4-8 for the restart procedures.

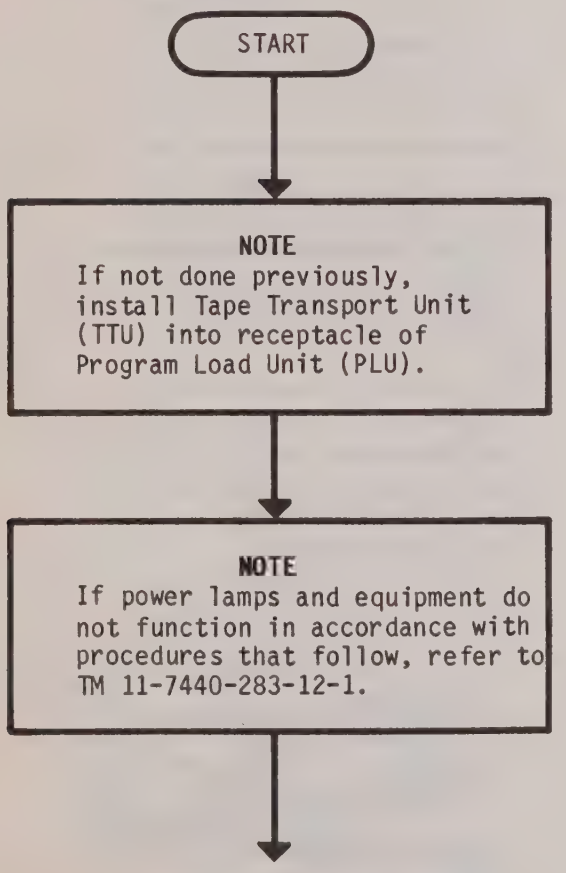
Section II. INITIALIZATION FLOWCHARTS

SECTION CONTENTS	PARA	PAGE
INITIALIZING THE BCS	4-6	4-5
SHUTTING DOWN THE BCS	4-7	4-22
RESTARTING THE BCS FOLLOWING A POWER FAILURE	4-8	4-26

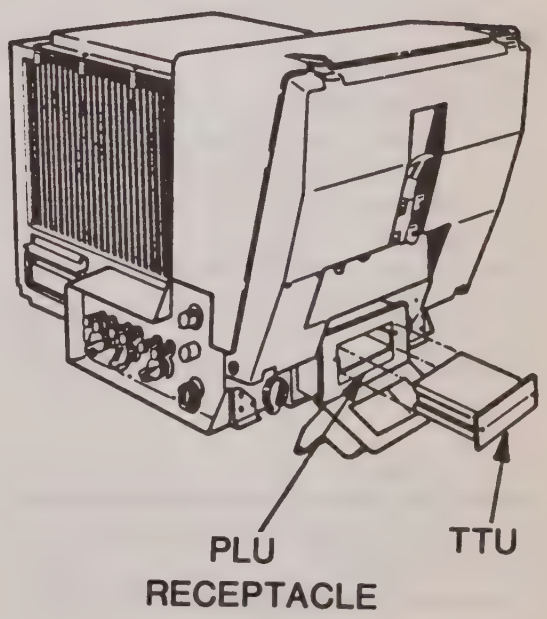
4-6. INITIALIZING THE BCS

Use this flowchart to perform the following task:

- Initialize the BCS.


START
NOTE
If not done previously, install Tape Transport Unit (TTU) into receptacle of Program Load Unit (PLU).
NOTE
If power lamps and equipment do not function in accordance with procedures that follow, refer to TM 11-7440-283-12-1.

Continued on next page



4-6. INITIALIZING THE BCS - CONTINUED

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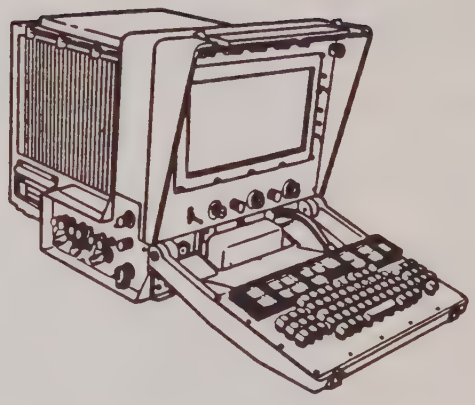
STEP 01

Lower keyboard to operating position



STEP 02

Set PWR switch on BCU to ON

Are following lamps on?

BAT PWR (PDU)
BIT STATUS PS (BCU)

NO

If batteries are installed, refer to TM 11-7440-283-12-1 for troubleshooting procedures. If batteries are not installed, these lamps will not light. Go to STEP 03.

YES

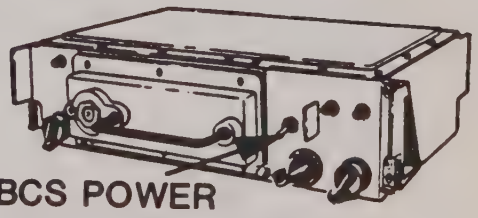
STEP 03

Set PWR switch on BCU to OFF

All lamps on the BCU and the PDU will go off.

STEP 04

Set BCS POWER circuit breaker on PDU to ON



BCS POWER CIRCUIT BREAKER

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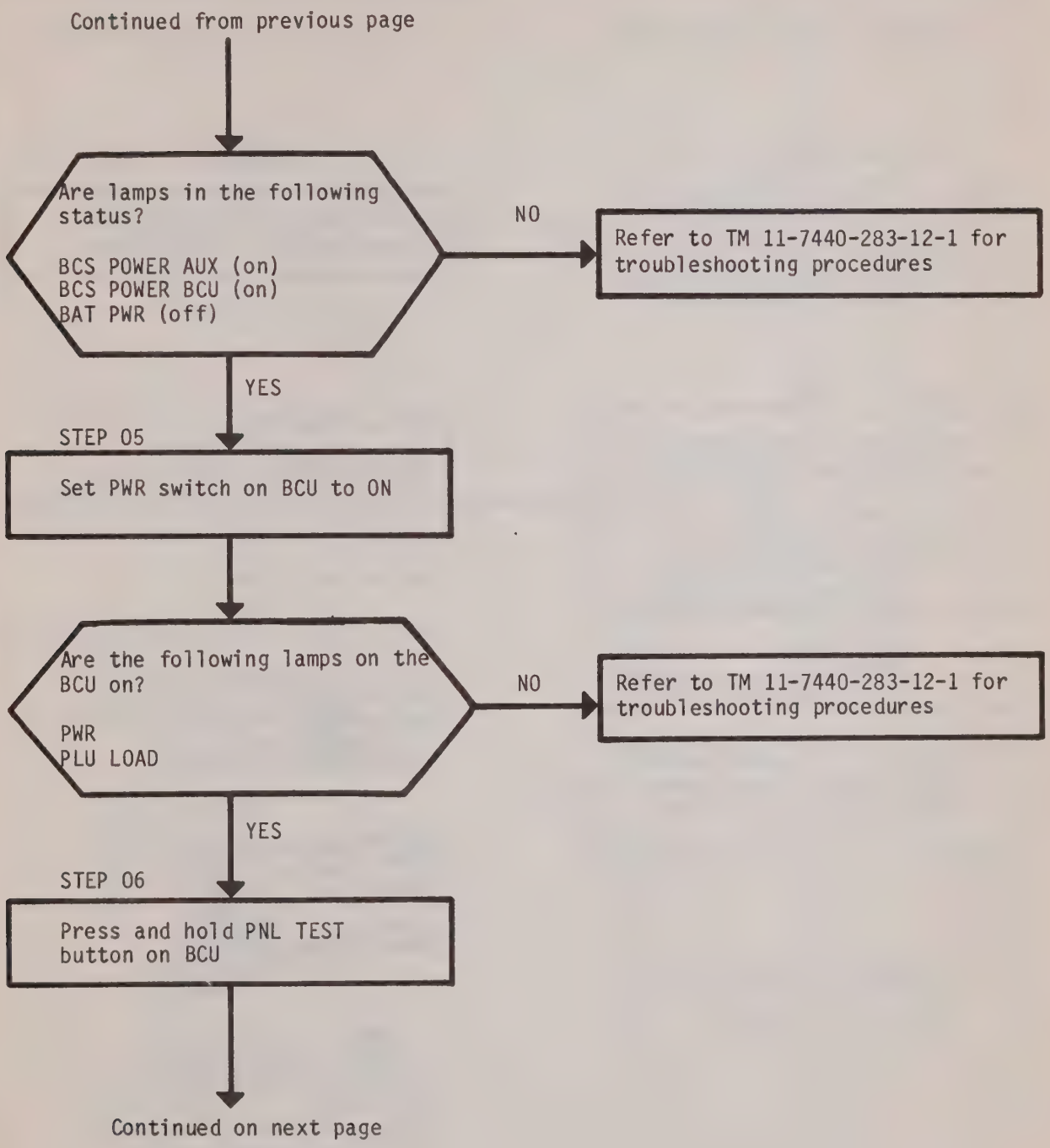
4-6. INITIALIZING THE BCS - CONTINUED



4-6. INITIALIZING THE BCS - CONTINUED

Continued from previous page

Do all front panel lamps and the external message lamp light? Does the alarm sound?

NO → Refer to TM 11-7440-283-12-1 for troubleshooting procedures.

YES

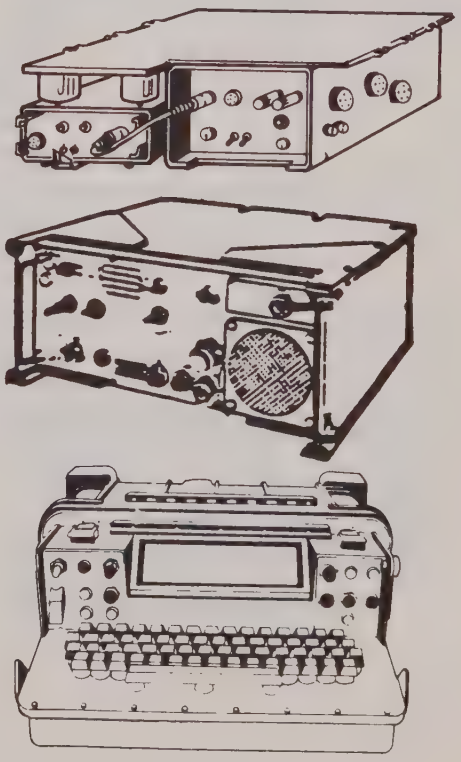
STEP 07

Turn on and adjust radios and amplifier/power supply group. Refer to TM 11-5820-401-10-1, TM 11-5820-401-10-2, TM 11-5820-882-10, and TM 11-5820-886-13.

TM 11-5820-882-10 and TM 11--5820-886-13 are for the radios used with the GDU. The GDU is not used with the HIP weapon.

STEP 08

If it is to be used, turn on printer. If the AN/UGC-74A (V)(3) printer is being used, refer to TM 11-5815-602-12.



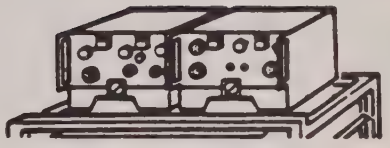
Continued on next page

4-6. INITIALIZING THE BCS - CONTINUED

Continued from previous page

STEP 09

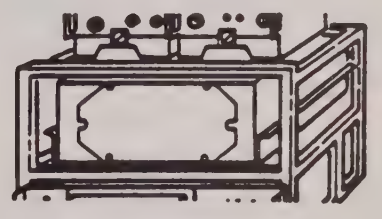
If it is to be used, turn on KY-57 and CMSC. Refer to KAO-168B/TSEC and to TM 11-5810-316-12.



STEP 10

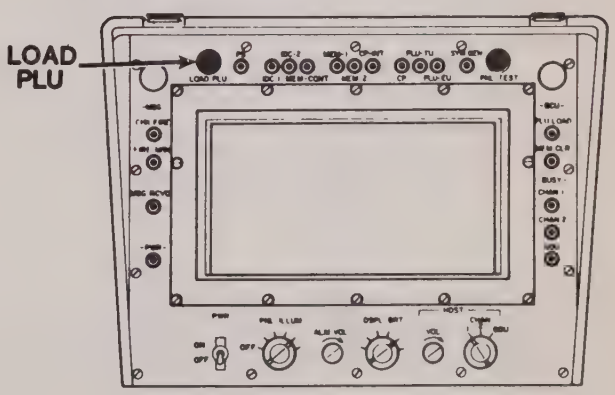
If it is to be used, turn on KG-31. Refer to KAO-137D/TSEC.

The KG-31 cannot be used at the BCS for communications with the AFCS.



STEP 11

Press LOAD PLU button on BCU



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4-6. INITIALIZING THE BCS - CONTINUED

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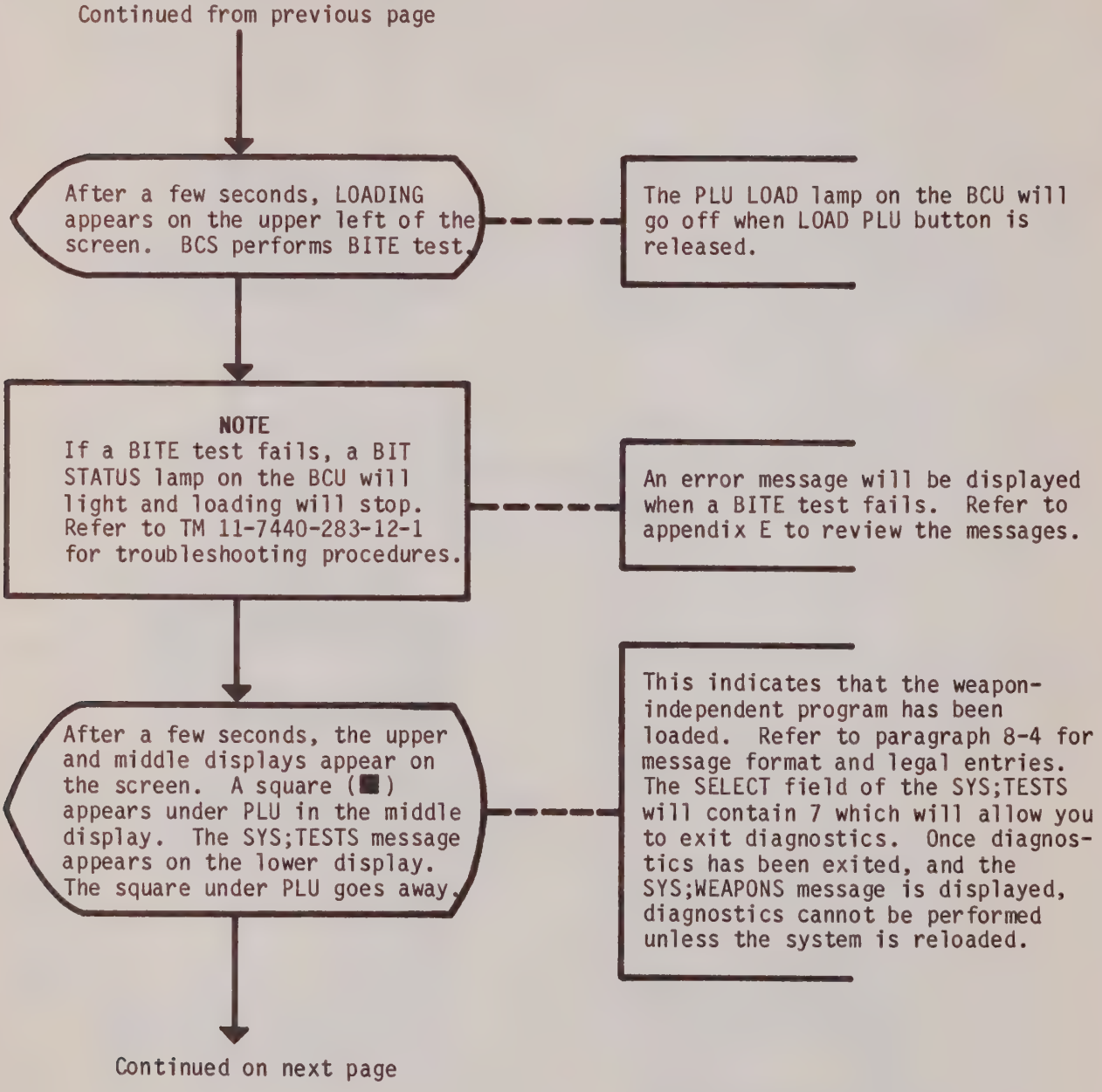
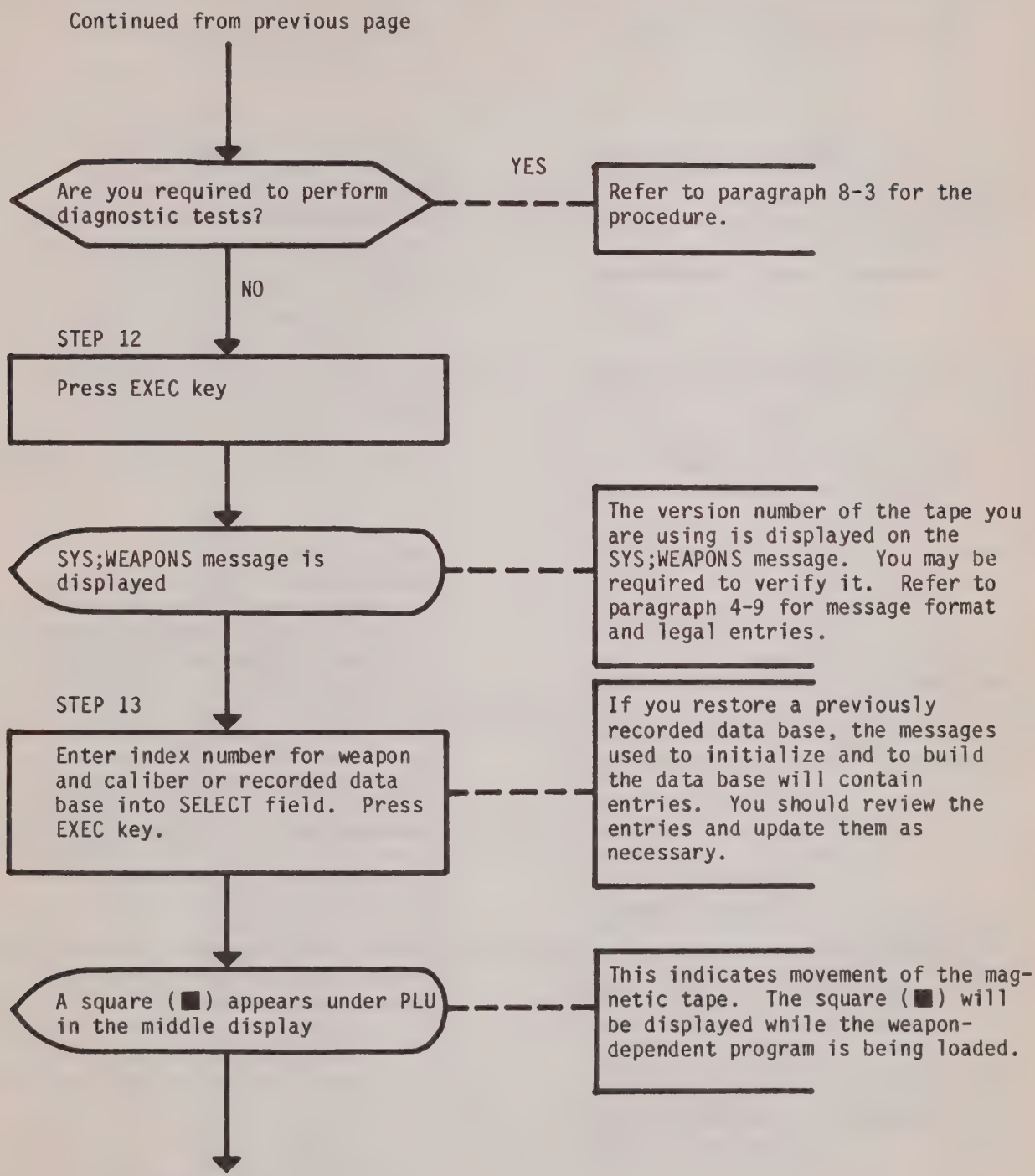

After a few seconds, LOADING appears on the upper left of the screen. BCS performs BITE test.
The PLU LOAD lamp on the BCU will go off when LOAD PLU button is released.
NOTE
If a BITE test fails, a BIT STATUS lamp on the BCU will light and loading will stop. Refer to TM 11-7440-283-12-1 for troubleshooting procedures.
An error message will be displayed when a BITE test fails. Refer to appendix E to review the messages.
After a few seconds, the upper and middle displays appear on the screen. A square (■) appears under PLU in the middle display. The SYS;TESTS message appears on the lower display. The square under PLU goes away.
This indicates that the weapon-independent program has been loaded. Refer to paragraph 8-4 for message format and legal entries. The SELECT field of the SYS;TESTS will contain 7 which will allow you to exit diagnostics. Once diagnostics has been exited, and the SYS;WEAPONS message is displayed, diagnostics cannot be performed unless the system is reloaded.

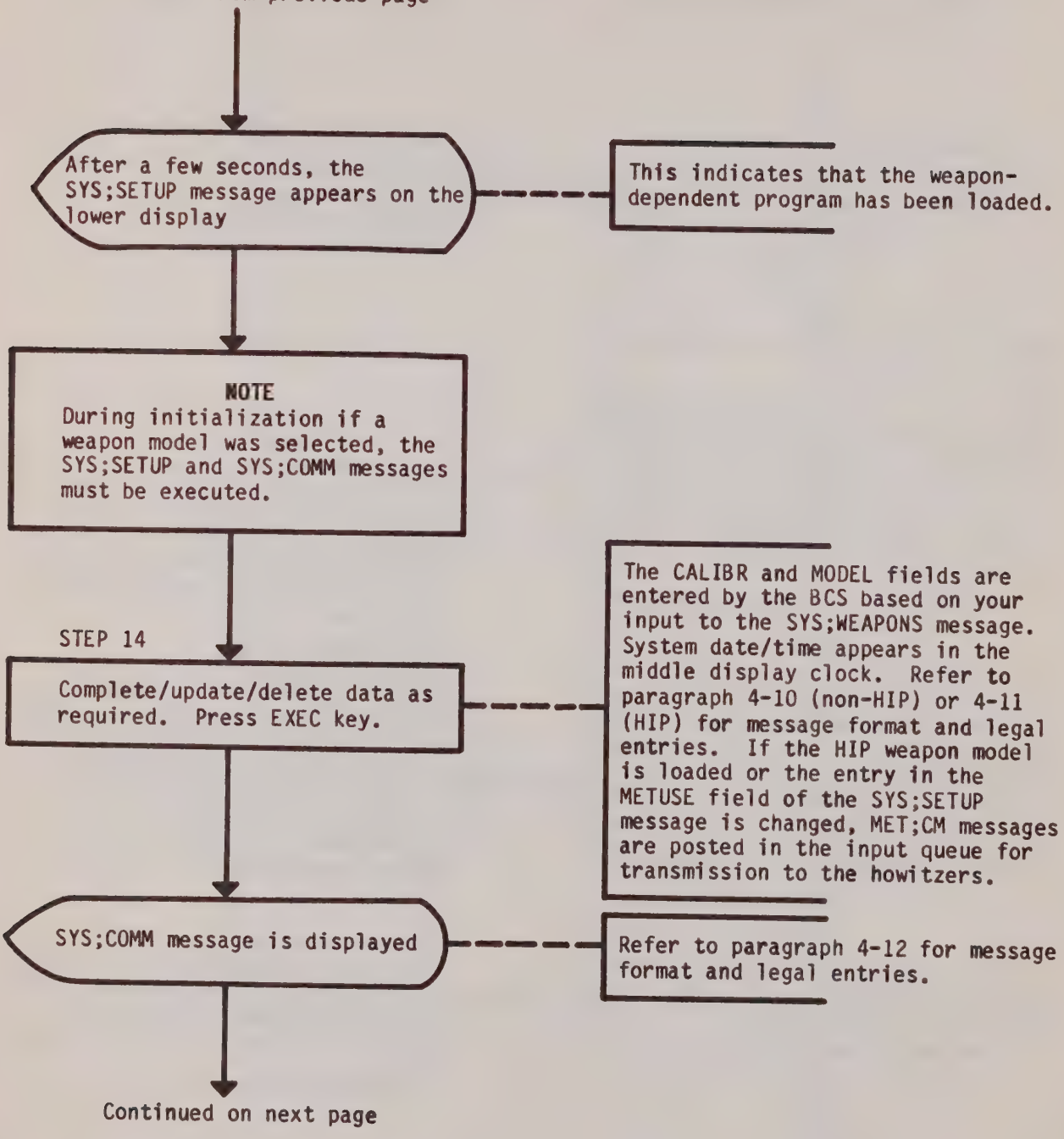
Continued on next page

4-6. INITIALIZING THE BCS - CONTINUED


Continued from previous page
Are you required to perform diagnostic tests?
YES
Refer to paragraph 8-3 for the procedure.
NO
STEP 12
Press EXEC key
SYS;WEAPONS message is displayed
The version number of the tape you are using is displayed on the SYS;WEAPONS message. You may be required to verify it. Refer to paragraph 4-9 for message format and legal entries.
STEP 13
Enter index number for weapon and caliber or recorded data base into SELECT field. Press EXEC key.
If you restore a previously recorded data base, the messages used to initialize and to build the data base will contain entries. You should review the entries and update them as necessary.
A square (■) appears under PLU in the middle display
This indicates movement of the magnetic tape. The square (■) will be displayed while the weapon-dependent program is being loaded.
Continued on next page

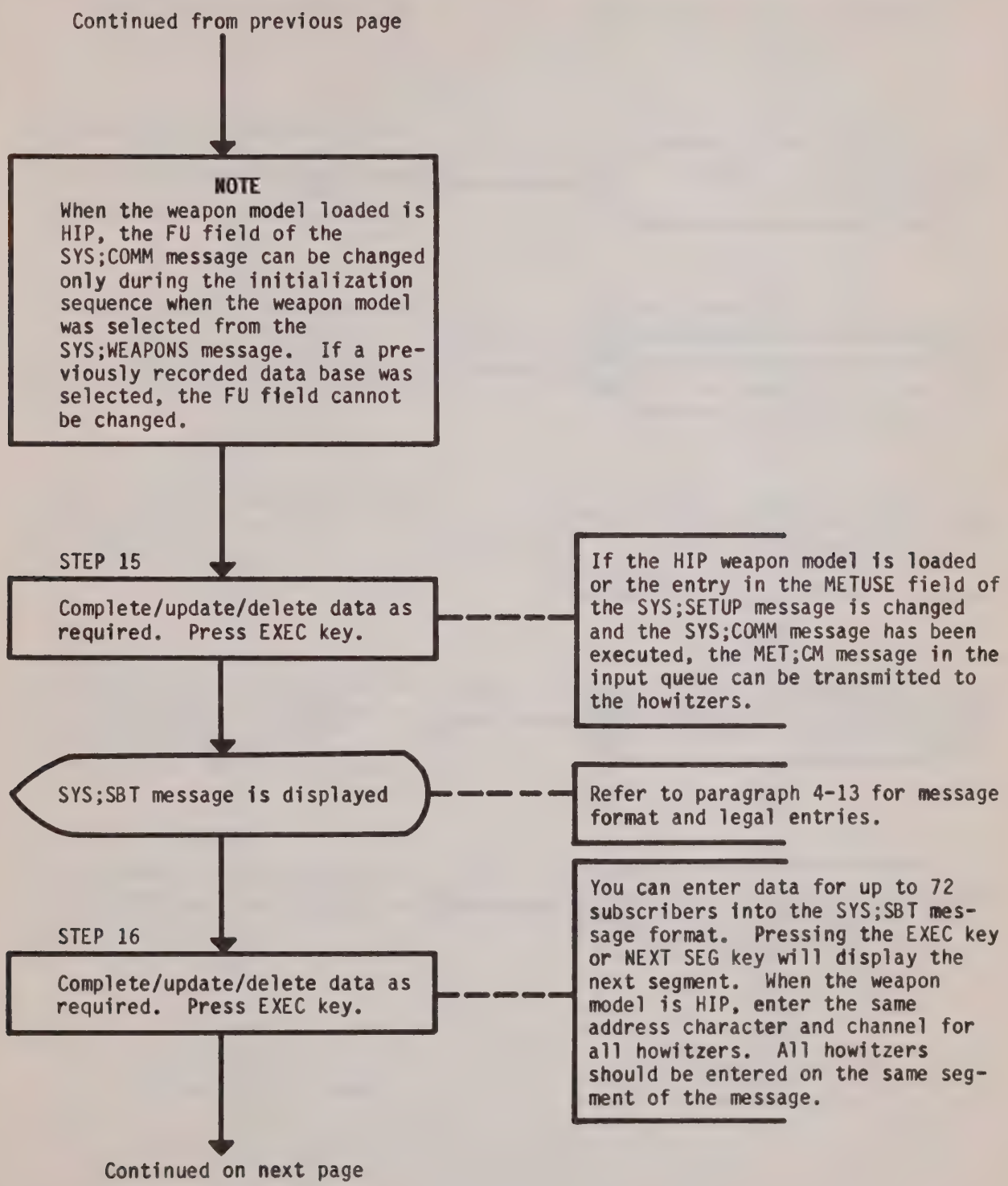
4-6. INITIALIZING THE BCS - CONTINUED

Continued from previous page


After a few seconds, the SYS;SETUP message appears on the lower display
This indicates that the weapon-dependent program has been loaded.
NOTE
During initialization if a weapon model was selected, the SYS;SETUP and SYS;COMM messages must be executed.
STEP 14
Complete/update/delete data as required. Press EXEC key.
The CALIBR and MODEL fields are entered by the BCS based on your input to the SYS;WEAPONS message. System date/time appears in the middle display clock. Refer to paragraph 4-10 (non-HIP) or 4-11 (HIP) for message format and legal entries. If the HIP weapon model is loaded or the entry in the METUSE field of the SYS;SETUP message is changed, MET;CM messages are posted in the input queue for transmission to the howitzers.
SYS;COMM message is displayed
Refer to paragraph 4-12 for message format and legal entries.

Continued on next page

4-6. INITIALIZING THE BCS - CONTINUED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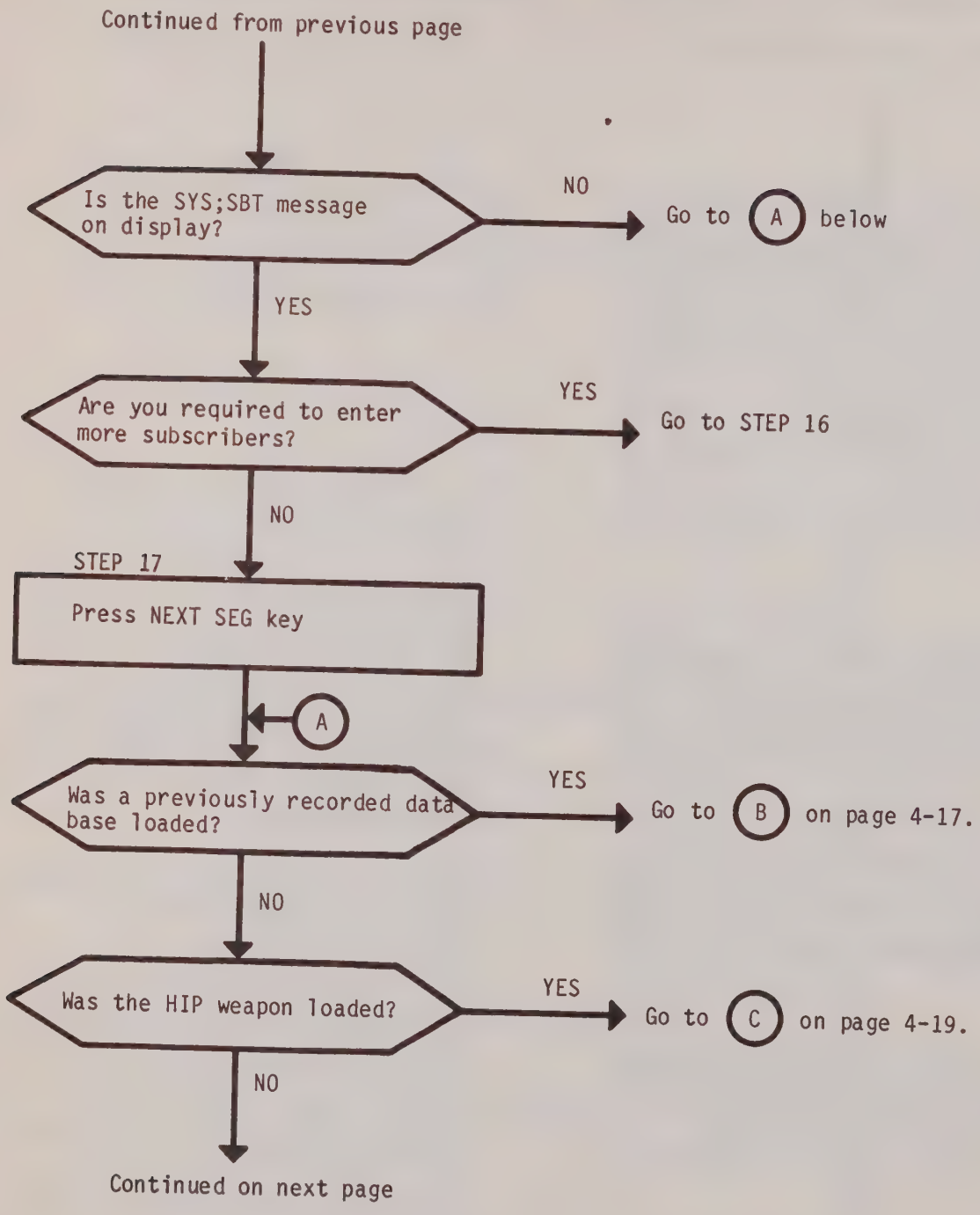
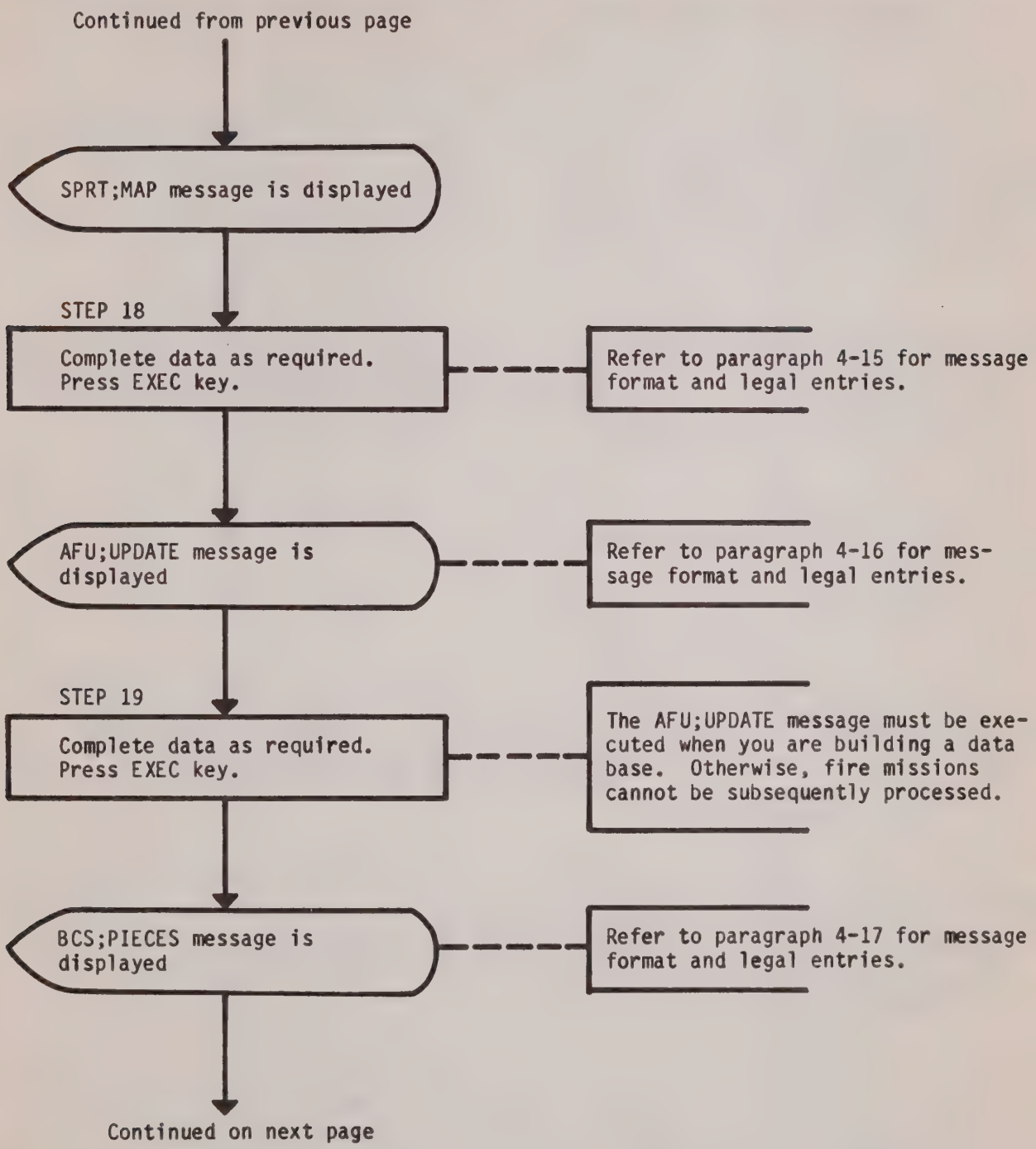
NOTE
When the weapon model loaded is HIP, the FU field of the SYS;COMM message can be changed only during the initialization sequence when the weapon model was selected from the SYS;WEAPONS message. If a previously recorded data base was selected, the FU field cannot be changed.
STEP 15
Complete/update/delete data as required. Press EXEC key.
If the HIP weapon model is loaded or the entry in the METUSE field of the SYS;SETUP message is changed and the SYS;COMM message has been executed, the MET;CM message in the input queue can be transmitted to the howitzers.
SYS;SBT message is displayed
Refer to paragraph 4-13 for message format and legal entries.
STEP 16
Complete/update/delete data as required. Press EXEC key.
You can enter data for up to 72 subscribers into the SYS;SBT message format. Pressing the EXEC key or NEXT SEG key will display the next segment. When the weapon model is HIP, enter the same address character and channel for all howitzers. All howitzers should be entered on the same segment of the message.
Continued on next page

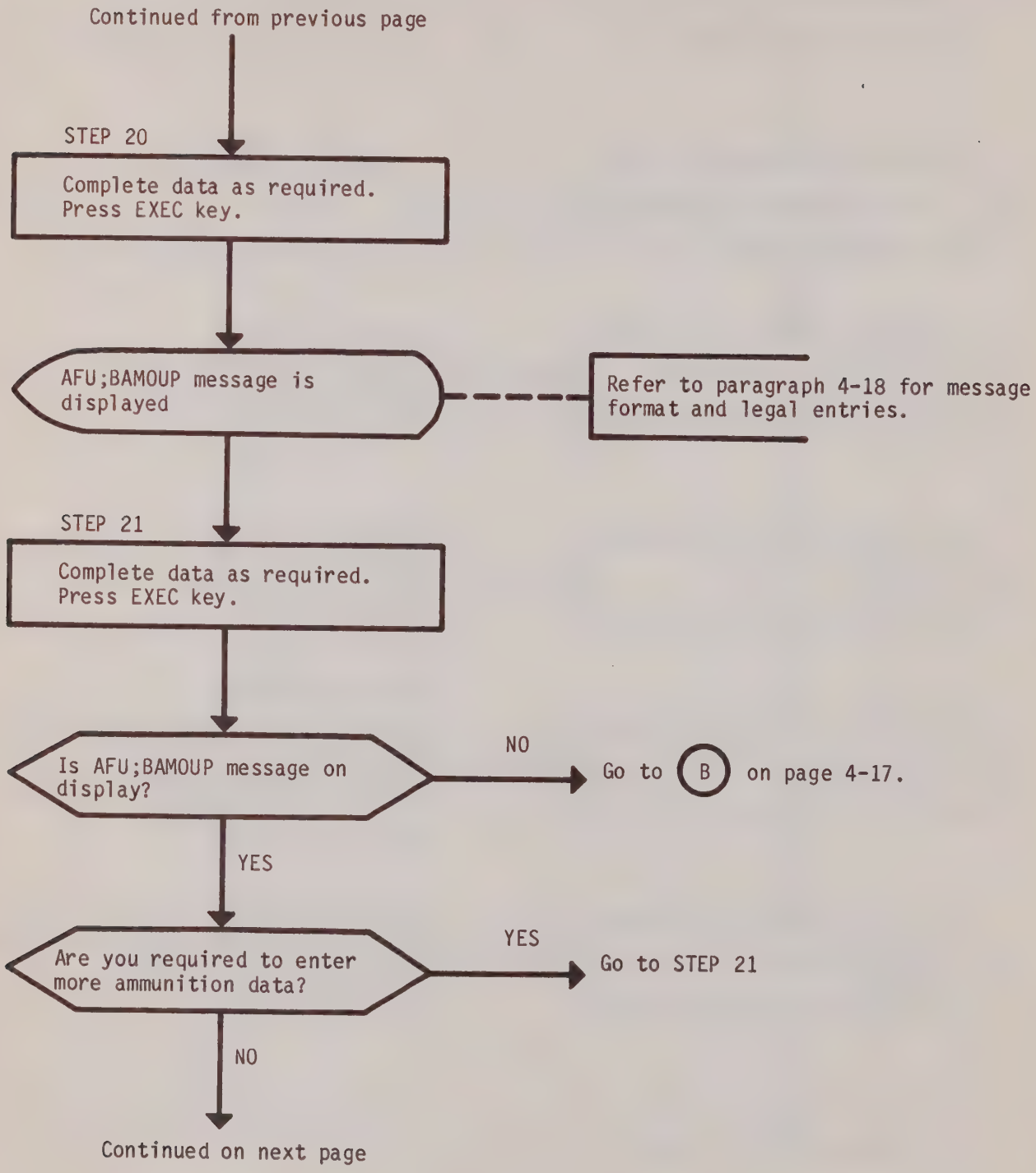
4-6. INITIALIZING THE BCS - CONTINUED



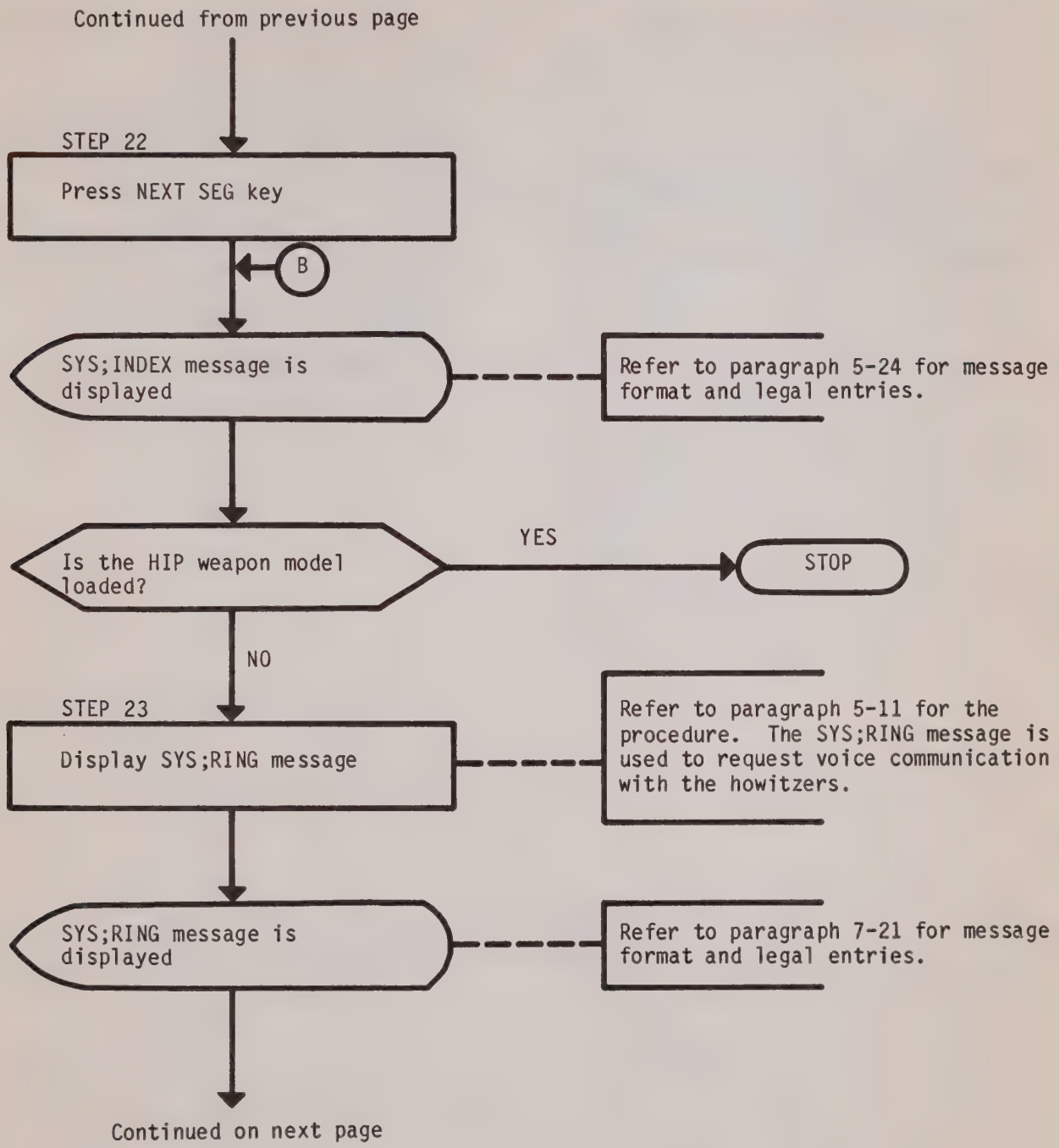
4-6. INITIALIZING THE BCS - CONTINUED


Continued from previous page
SPRT;MAP message is displayed
STEP 18
Complete data as required. Press EXEC key.
Refer to paragraph 4-15 for message format and legal entries.
AFU;UPDATE message is displayed
Refer to paragraph 4-16 for message format and legal entries.
STEP 19
Complete data as required. Press EXEC key.
The AFU;UPDATE message must be executed when you are building a data base. Otherwise, fire missions cannot be subsequently processed.
BCS;PIECES message is displayed
Refer to paragraph 4-17 for message format and legal entries.
Continued on next page

4-6. INITIALIZING THE BCS - CONTINUED


Continued from previous page
STEP 20
Complete data as required. Press EXEC key.
AFU;BAMOUP message is displayed
Refer to paragraph 4-18 for message format and legal entries.
STEP 21
Complete data as required. Press EXEC key.
Is AFU;BAMOUP message on display?
NO
Go to B on page 4-17.
YES
Are you required to enter more ammunition data?
YES
Go to STEP 21
NO
Continued on next page

4-6. INITIALIZING THE BCS - CONTINUED


Continued from previous page
STEP 22
Press NEXT SEG key
B
SYS;INDEX message is displayed
Refer to paragraph 5-24 for message format and legal entries.
Is the HIP weapon model loaded?
YES
STOP
NO
STEP 23
Display SYS;RING message
Refer to paragraph 5-11 for the procedure. The SYS;RING message is used to request voice communication with the howitzers.
SYS;RING message is displayed
Refer to paragraph 7-21 for message format and legal entries.
Continued on next page

4-6. INITIALIZING THE BCS - CONTINUED

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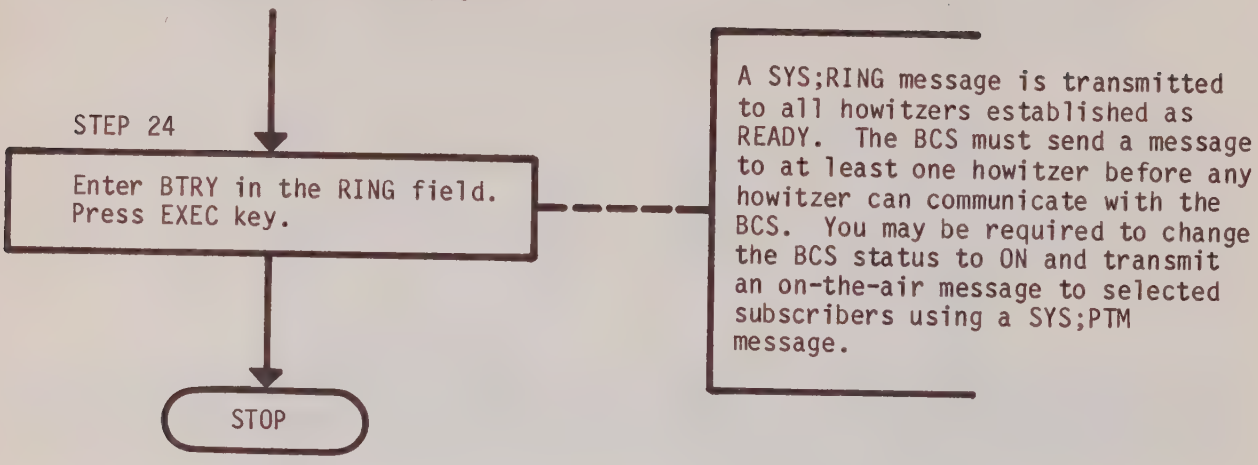
STEP 24
Enter BTRY in the RING field.
Press EXEC key.
STOP
A SYS;RING message is transmitted to all howitzers established as READY. The BCS must send a message to at least one howitzer before any howitzer can communicate with the BCS. You may be required to change the BCS status to ON and transmit an on-the-air message to selected subscribers using a SYS;PTM message.

4-6. INITIALIZING THE BCS - CONTINUED

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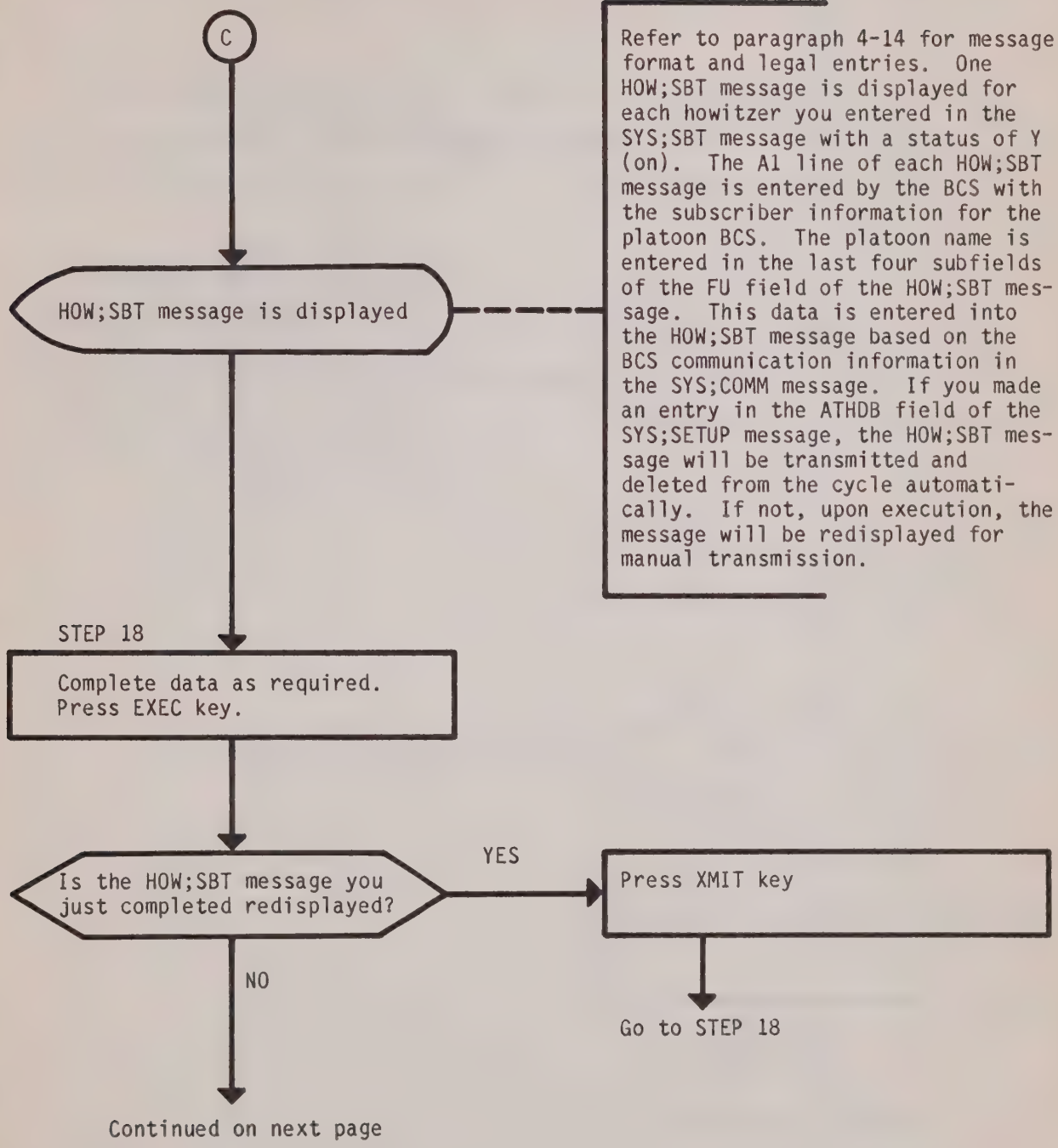
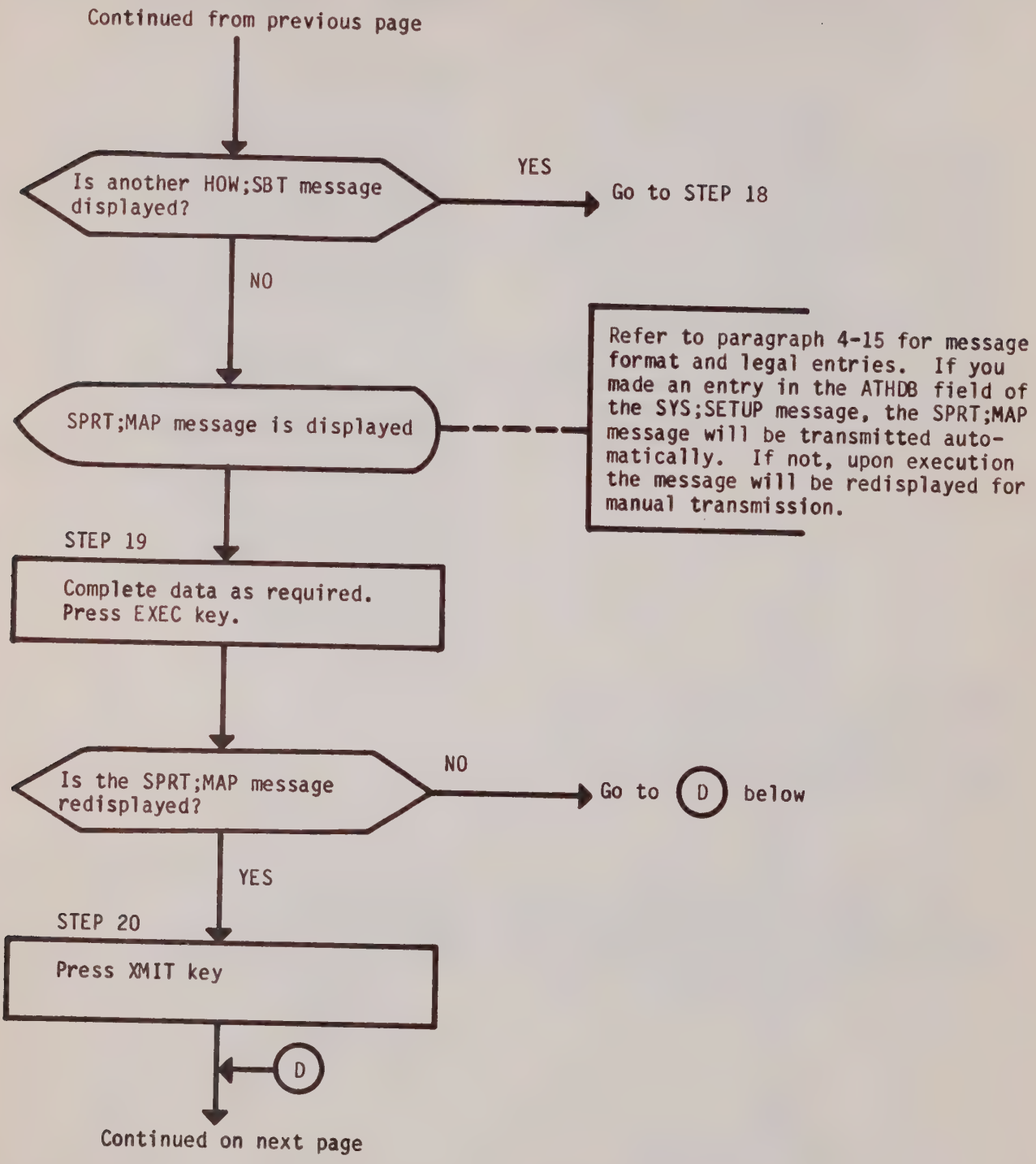
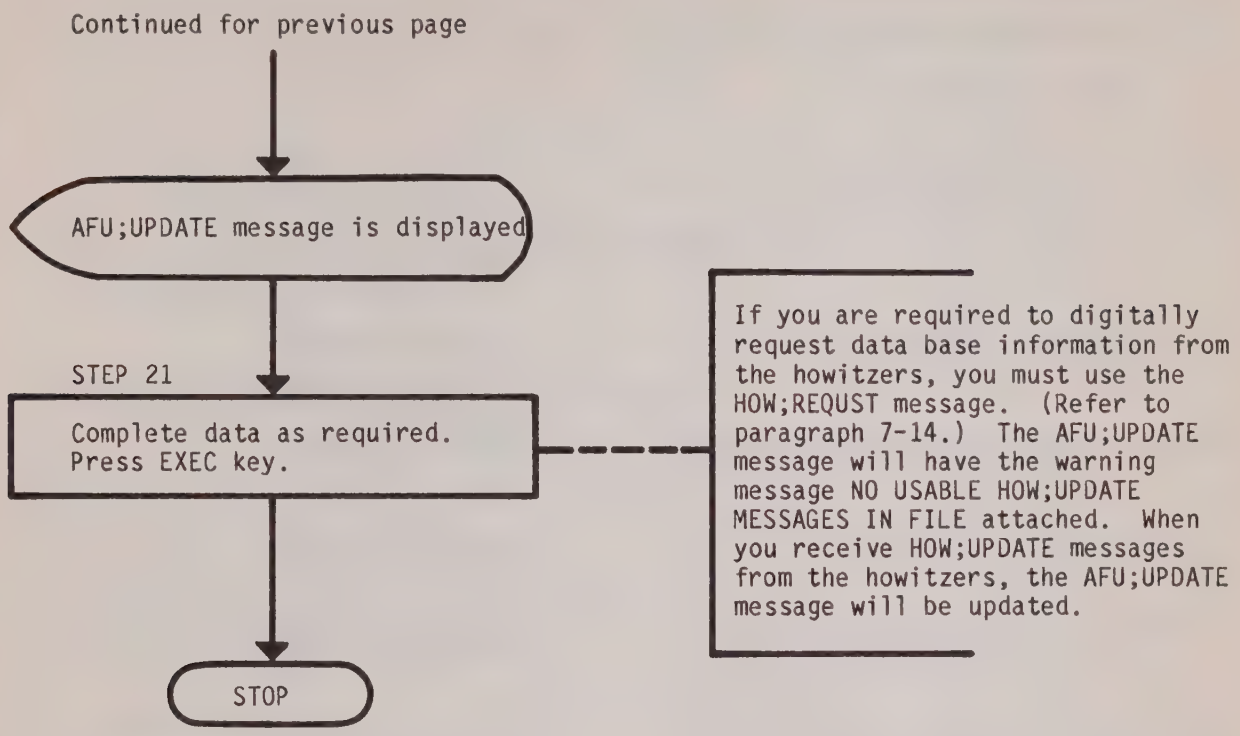

C
HOW;SBT message is displayed
Refer to paragraph 4-14 for message format and legal entries. One HOW;SBT message is displayed for each howitzer you entered in the SYS;SBT message with a status of Y (on). The A1 line of each HOW;SBT message is entered by the BCS with the subscriber information for the platoon BCS. The platoon name is entered in the last four subfields of the FU field of the HOW;SBT message. This data is entered into the HOW;SBT message based on the BCS communication information in the SYS;COMM message. If you made an entry in the ATHDB field of the SYS;SETUP message, the HOW;SBT message will be transmitted and deleted from the cycle automatically. If not, upon execution, the message will be redisplayed for manual transmission.
STEP 18
Complete data as required. Press EXEC key.
Is the HOW;SBT message you just completed redisplayed?
YES
Press XMIT key
Go to STEP 18
NO
Continued on next page

4-6. INITIALIZING THE BCS - CONTINUED


Continued from previous page
Is another HOW;SBT message displayed?
YES
Go to STEP 18
NO
SPRT;MAP message is displayed
Refer to paragraph 4-15 for message format and legal entries. If you made an entry in the ATHDB field of the SYS;SETUP message, the SPRT;MAP message will be transmitted automatically. If not, upon execution the message will be redisplayed for manual transmission.
STEP 19
Complete data as required. Press EXEC key.
Is the SPRT;MAP message redisplayed?
NO
Go to (D) below
YES
STEP 20
Press XMIT key
(D)
Continued on next page

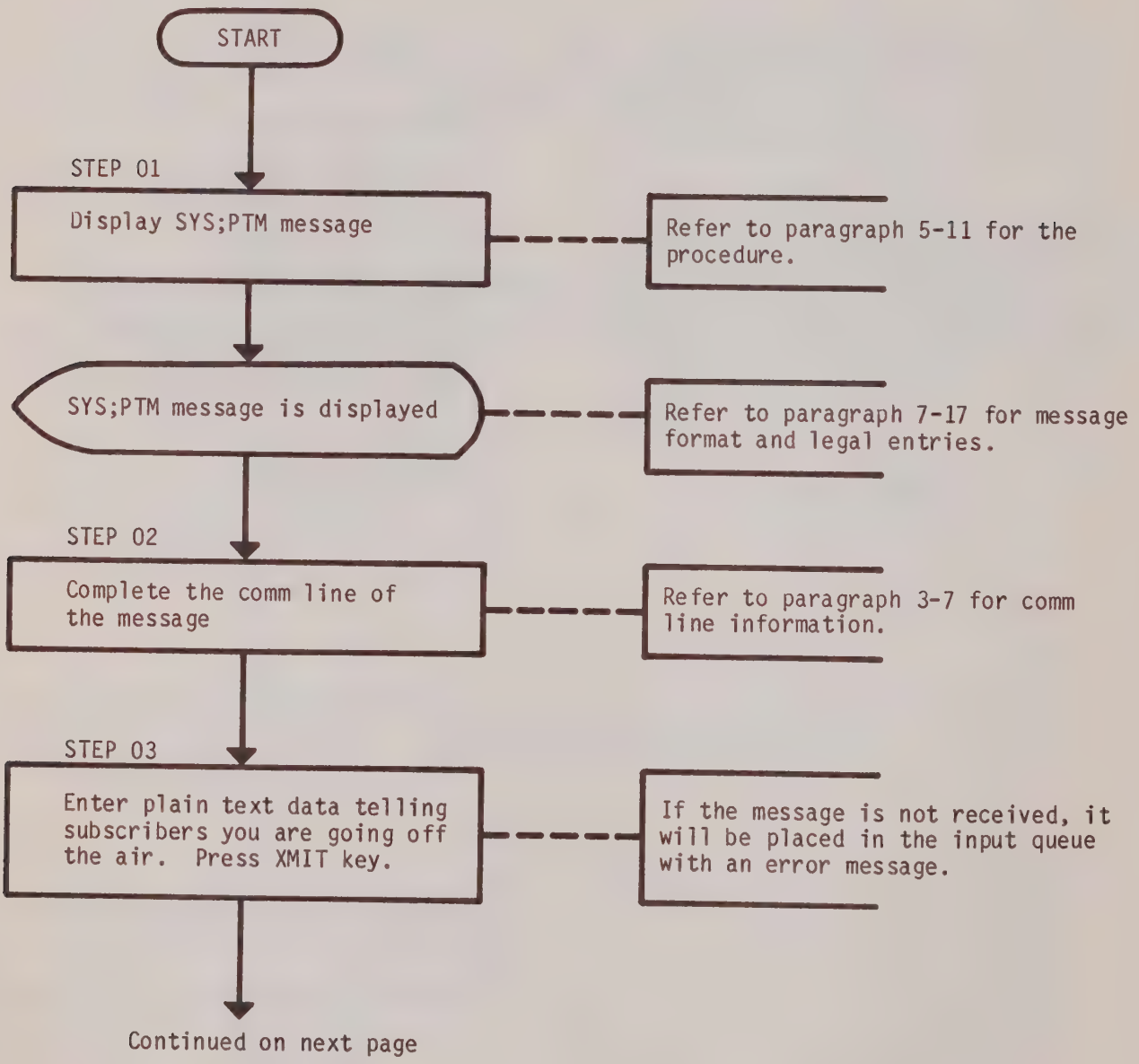
4-6. INITIALIZING THE BCS - CONTINUED


Continued for previous page
AFU;UPDATE message is displayed
STEP 21
Complete data as required.
Press EXEC key.
STOP
If you are required to digitally request data base information from the howitzers, you must use the HOW;REQUST message. (Refer to paragraph 7-14.) The AFU;UPDATE message will have the warning message NO USABLE HOW;UPDATE MESSAGES IN FILE attached. When you receive HOW;UPDATE messages from the howitzers, the AFU;UPDATE message will be updated.

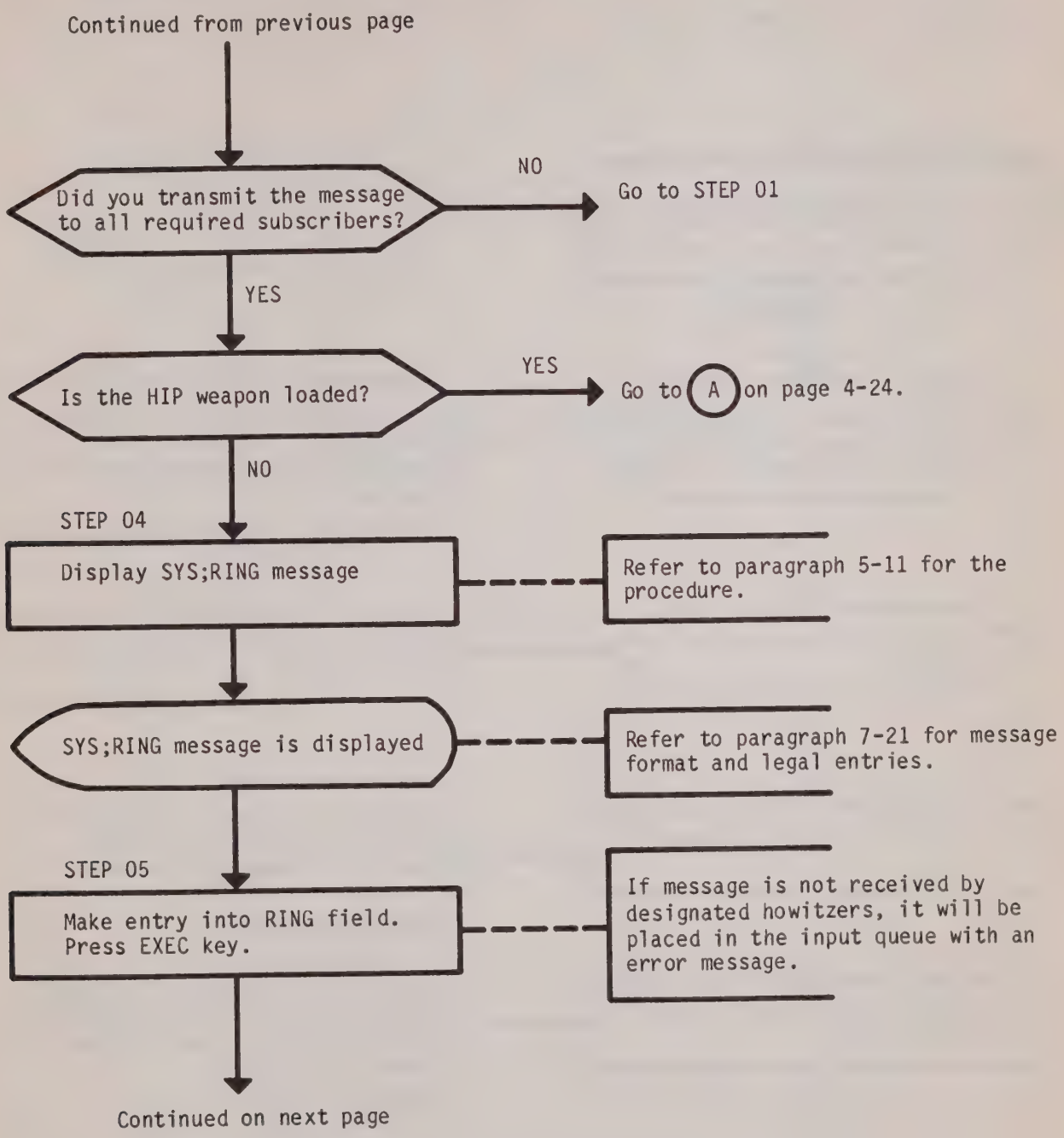
4-7. SHUTTING DOWN THE BCS

Use this flowchart to perform the following task:

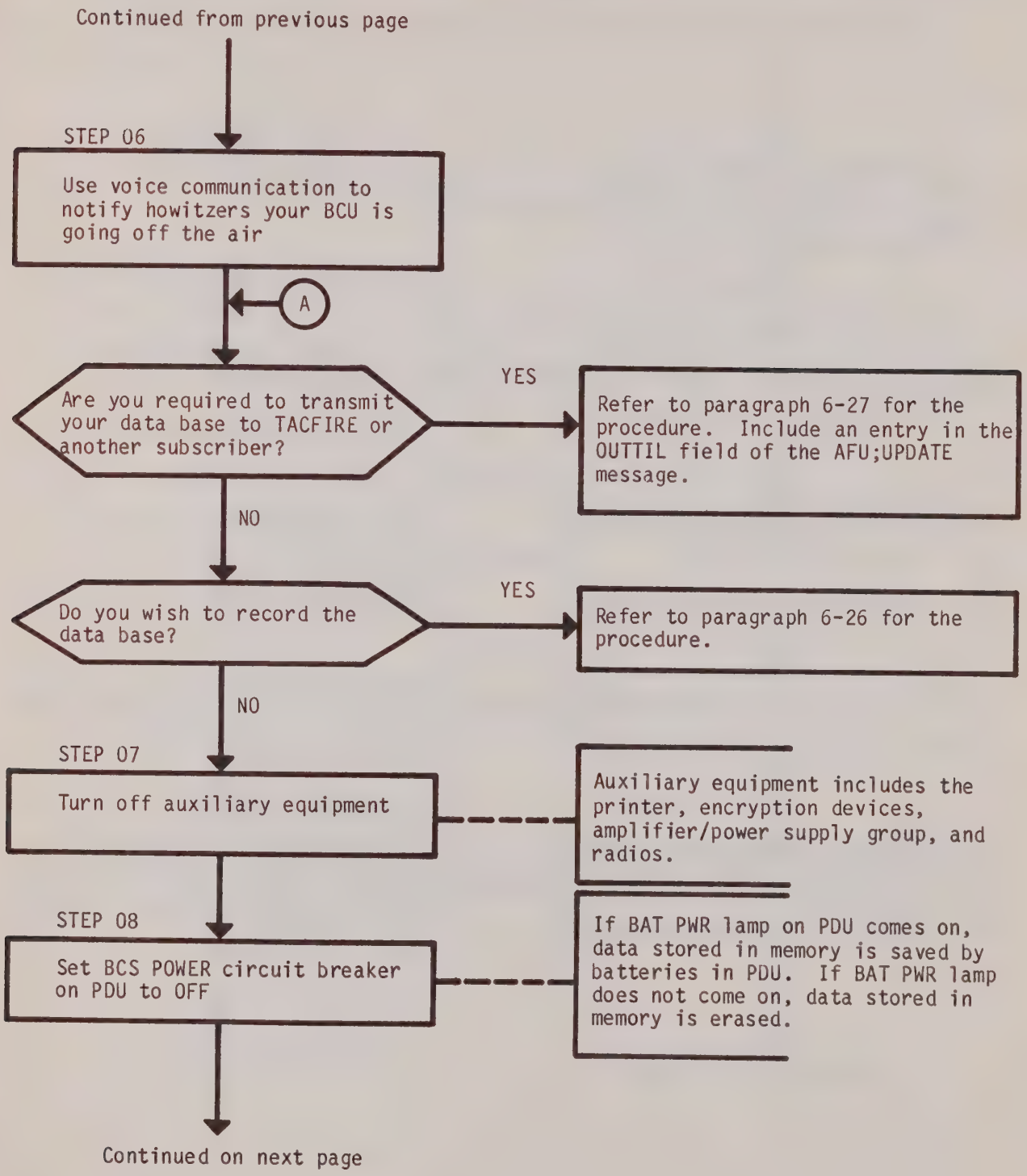
- Shut Down the BCS.


START
STEP 01
Display SYS;PTM message
Refer to paragraph 5-11 for the procedure.
SYS;PTM message is displayed
Refer to paragraph 7-17 for message format and legal entries.
STEP 02
Complete the comm line of the message
Refer to paragraph 3-7 for comm line information.
STEP 03
Enter plain text data telling subscribers you are going off the air. Press XMIT key.
If the message is not received, it will be placed in the input queue with an error message.
Continued on next page

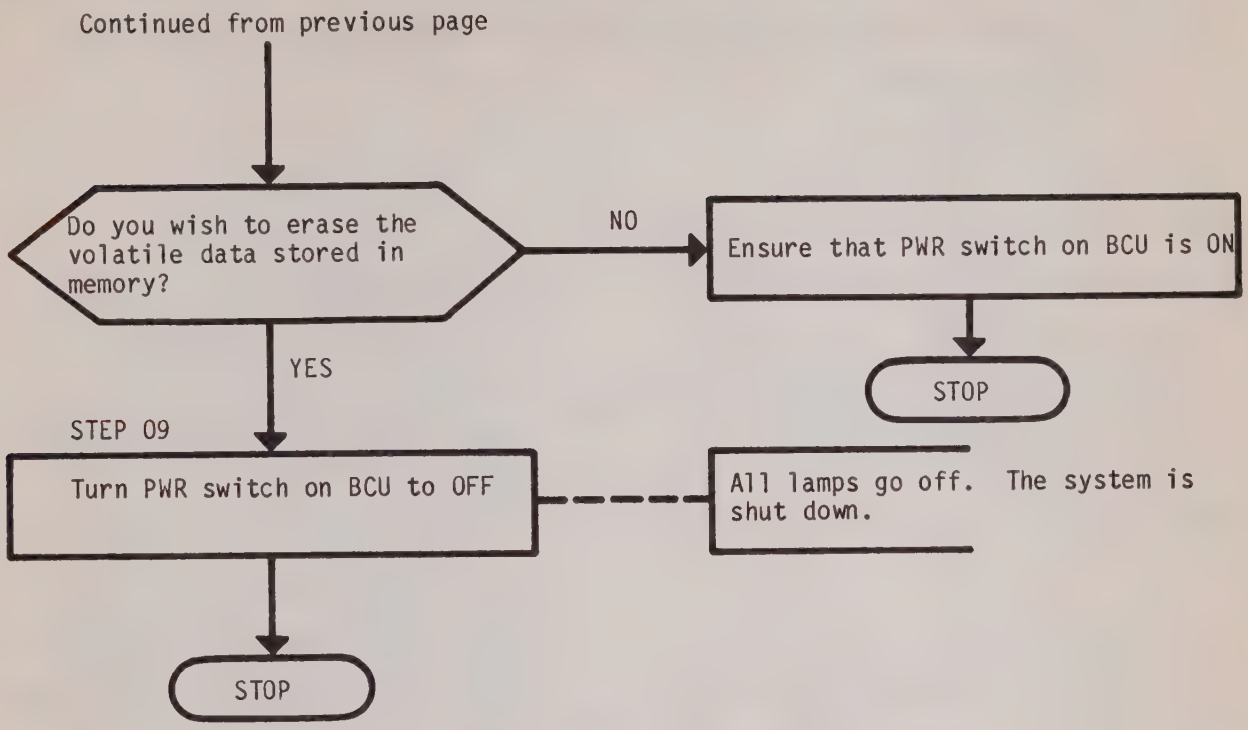
4-7. SHUTTING DOWN THE BCS - CONTINUED


Continued from previous page
Did you transmit the message to all required subscribers?
NO
Go to STEP 01
YES
Is the HIP weapon loaded?
YES
Go to A on page 4-24.
NO
STEP 04
Display SYS;RING message
Refer to paragraph 5-11 for the procedure.
SYS;RING message is displayed
Refer to paragraph 7-21 for message format and legal entries.
STEP 05
Make entry into RING field. Press EXEC key.
If message is not received by designated howitzers, it will be placed in the input queue with an error message.
Continued on next page

4-7. SHUTTING DOWN THE BCS - CONTINUED

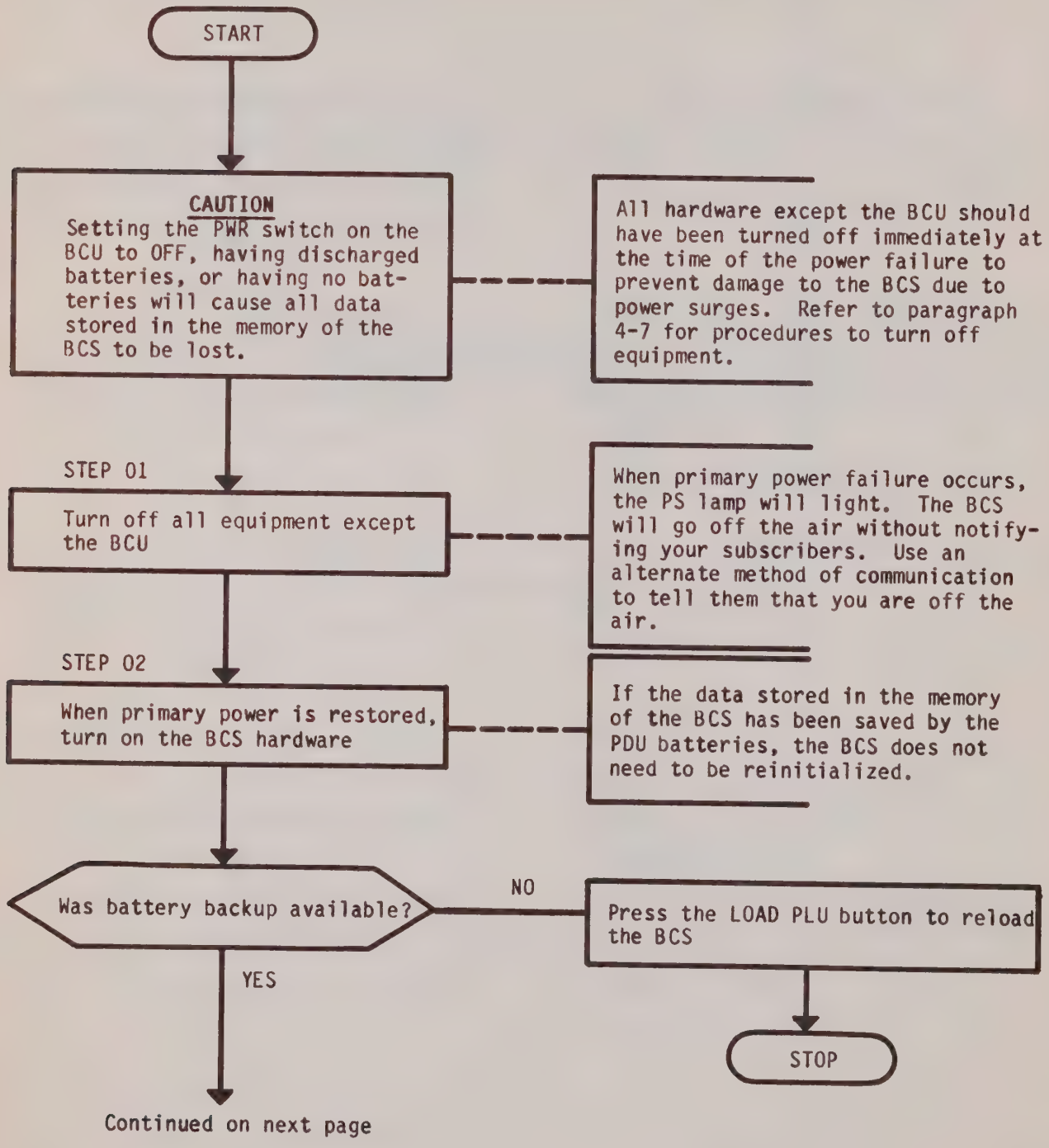

Continued from previous page
STEP 06
Use voice communication to notify howitzers your BCU is going off the air
A
Are you required to transmit your data base to TACFIRE or another subscriber?
YES
Refer to paragraph 6-27 for the procedure. Include an entry in the OUTTIL field of the AFU;UPDATE message.
NO
Do you wish to record the data base?
YES
Refer to paragraph 6-26 for the procedure.
NO
STEP 07
Turn off auxiliary equipment
Auxiliary equipment includes the printer, encryption devices, amplifier/power supply group, and radios.
STEP 08
Set BCS POWER circuit breaker on PDU to OFF
If BAT PWR lamp on PDU comes on, data stored in memory is saved by batteries in PDU. If BAT PWR lamp does not come on, data stored in memory is erased.
Continued on next page

4-7. SHUTTING DOWN THE BCS - CONTINUED

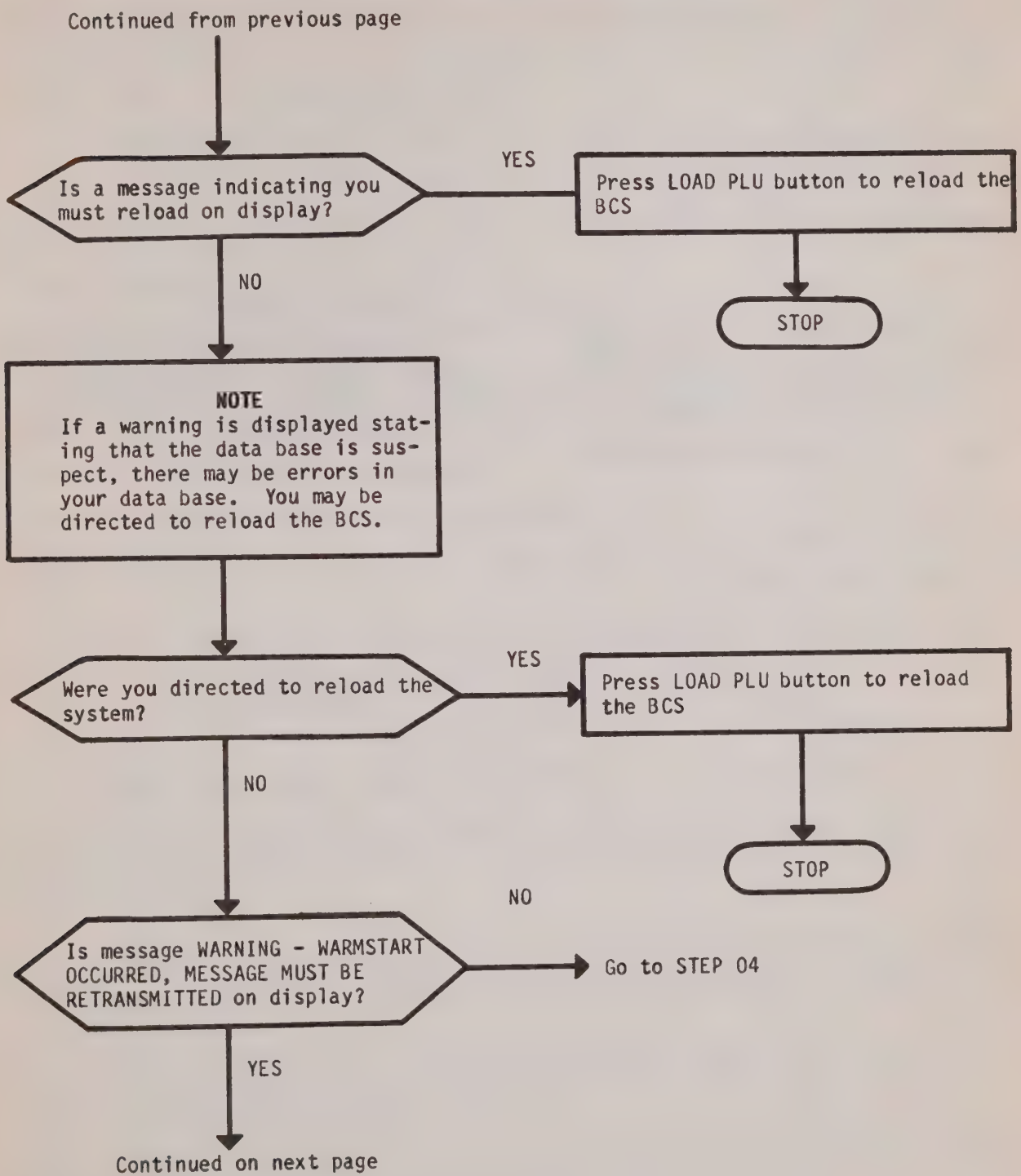

Continued from previous page
Do you wish to erase the volatile data stored in memory?
NO
Ensure that PWR switch on BCU is ON
STOP
YES
STEP 09
Turn PWR switch on BCU to OFF
All lamps go off. The system is shut down.
STOP

4-8. RESTARTING THE BCS FOLLOWING A POWER FAILURE

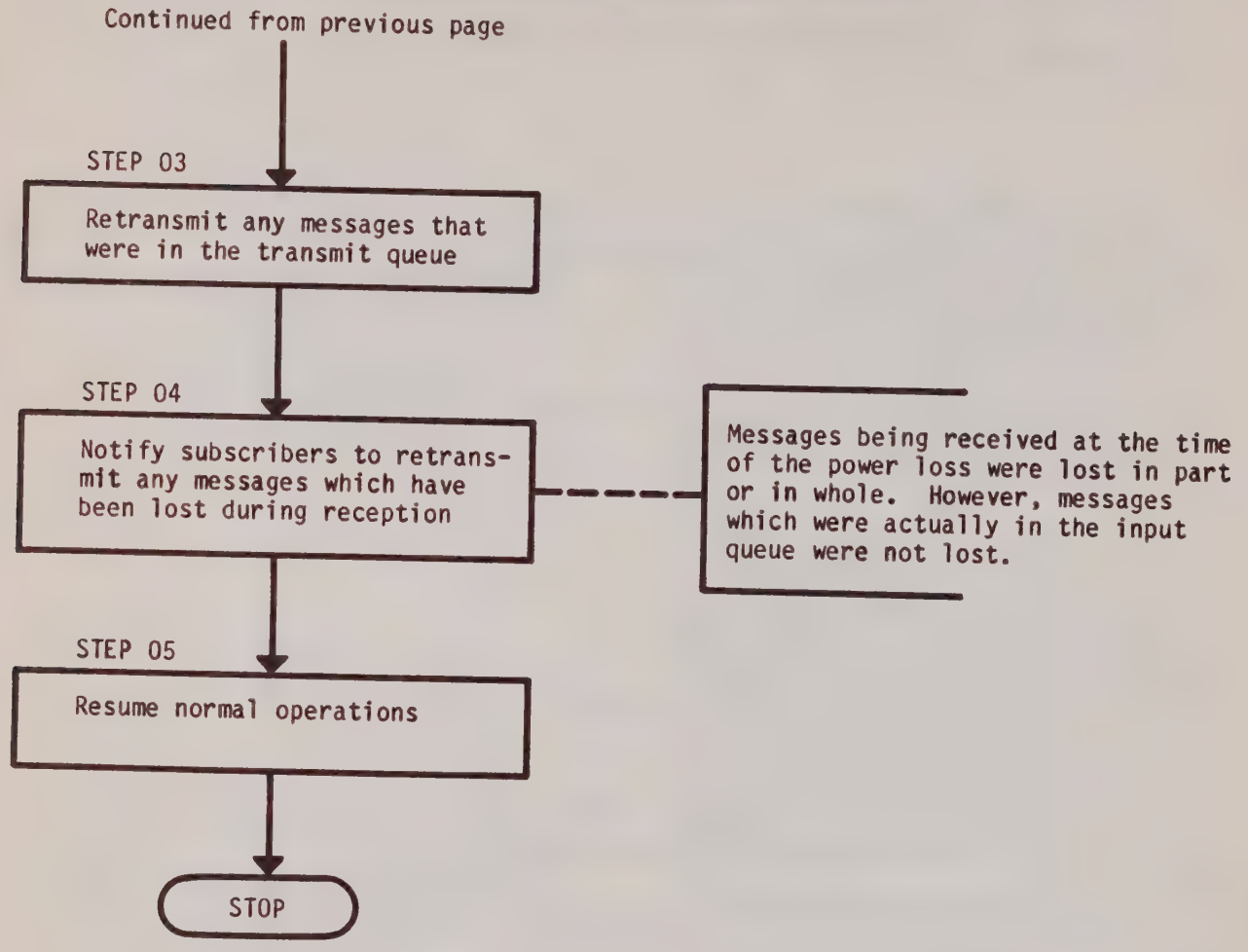
Use this flowchart to restart the BCS after a power failure.


START
CAUTION
Setting the PWR switch on the BCU to OFF, having discharged batteries, or having no batteries will cause all data stored in the memory of the BCS to be lost.
All hardware except the BCU should have been turned off immediately at the time of the power failure to prevent damage to the BCS due to power surges. Refer to paragraph 4-7 for procedures to turn off equipment.
STEP 01
Turn off all equipment except the BCU
When primary power failure occurs, the PS lamp will light. The BCS will go off the air without notifying your subscribers. Use an alternate method of communication to tell them that you are off the air.
STEP 02
When primary power is restored, turn on the BCS hardware
If the data stored in the memory of the BCS has been saved by the PDU batteries, the BCS does not need to be reinitialized.
Was battery backup available?
NO
Press the LOAD PLU button to reload the BCS
STOP
YES
Continued on next page

4-8. RESTARTING THE BCS FOLLOWING A POWER FAILURE - CONTINUED


Continued from previous page
Is a message indicating you must reload on display?
YES
Press LOAD PLU button to reload the BCS
STOP
NO
NOTE
If a warning is displayed stating that the data base is suspect, there may be errors in your data base. You may be directed to reload the BCS.
Were you directed to reload the system?
YES
Press LOAD PLU button to reload the BCS
STOP
NO
Is message WARNING - WARMSTART OCCURRED, MESSAGE MUST BE RETRANSMITTED on display?
NO
Go to STEP 04
YES
Continued on next page

4-8. RESTARTING THE BCS FOLLOWING A POWER FAILURE - CONTINUED


Continued from previous page
STEP 03
Retransmit any messages that were in the transmit queue
STEP 04
Notify subscribers to retransmit any messages which have been lost during reception
Messages being received at the time of the power loss were lost in part or in whole. However, messages which were actually in the input queue were not lost.
STEP 05
Resume normal operations
STOP

Section III. INITIALIZATION MESSAGE FORMATS

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NOTE

The data entered into the SYS;WEAPONS, SYS;SETUP, SYS;COMM, and SYS;SBT messages is used internally by your computer only. Therefore, they cannot be transmitted on channels 1 and 2, and the message formats do not have comm lines.

4-9. SYSTEM WEAPONS INDEX MESSAGE (SYS;WEAPONS)

a. Purpose. The SYS;WEAPONS message is used to begin loading of a weapon-dependent software program from the TTU to the memory of the BCS. You may choose a recorded data base or a weapon caliber and model to be used for building a new data base.

b. Source. The SYS;WEAPONS message is displayed automatically during program loading. After the weapon-independent program is loaded, the upper, middle, and lower displays appear on the screen of the BCU. The SYS;WEAPONS message will be on the lower display.

c. Input. The only entry you make into the SYS;WEAPONS message is the index number for the recorded data base you are restoring or for the weapon caliber and model you are using for a new data base.

d. Computer Processing. Pressing the EXEC key causes the weapon-dependent program you chose to be loaded from the TTU to the memory of the BCS.

4-9. SYSTEM WEAPONS INDEX MESSAGE (SYS;WEAPONS) - CONTINUED

e. Output. Pressing the EXEC key will cause a solid square (■) to appear under PLU in the middle display. This indicates movement of the magnetic tape. After the weapon-dependent program has been loaded, the SYS;SETUP message will appear on the lower display.

f. Message Format and Legal Entries. The following SYS;WEAPONS message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

```
SYS;WEAPONS;C:___;        VERSION 740000 - XXXXXXXX

  1:155MM/M109A2           8:105MM/M102
  2:155MM/M109A3           9:105MM/M119
  3:155MM/HIP             10:8IN/M110A2
  4:155MM/M114A1          11:14.5MM/M31
  5:155MM/M114A2          12:DATABASE1  __/___/__ __/__/__ ______/______
  6:155MM/M198            13:DATABASE2  __/___/__ __/__/__ ______/______
  7:105MM/M101A1

SELECT:__;
```

SYS;WEAPONS; C:___;

SYS;WEAPONS identifies the message as the system weapons index message.

SYS;WEAPONS; **C:___;**

The C field indicates the security classification of the message. This is an optional entry. Legal entries are explained in appendix H.

Default = UN (unclassified)

VERSION 740000 - XXXXXXXX

The version number identifies the version of the tape you are using.

1:155MM/M109A2

Choosing number 1 from the SYS;WEAPONS message indicates that the weapons used will be 155MM, model M109A2.

4-9. SYSTEM WEAPONS INDEX MESSAGE (SYS;WEAPONS) - CONTINUED

2:155MM/M109A3

Choosing number 2 from the SYS;WEAPONS message indicates that the weapons used will be 155MM, model M109A3.

3:155MM/HIP

Choosing number 3 from the SYS;WEAPONS message indicates that the weapons used will be 155MM, HIP model.

4:155MM/M114A1

Choosing number 4 from the SYS;WEAPONS message indicates that the weapons used will be 155MM, model M114A1.

5:155MM/M114A2

Choosing number 5 from the SYS;WEAPONS message indicates that the weapons used will be 155MM, model M114A2.

6:155MM/M198

Choosing number 6 from the SYS;WEAPONS message indicates that the weapons used will be 155MM, model M198.

7:105MM/M101A1

Choosing number 7 from the SYS;WEAPONS message indicates that the weapons used will be 105MM, model M101A1.

8:105MM/M102

Choosing number 8 from the SYS;WEAPONS message indicates that the weapons used will be 105MM, model M102.

4-9. SYSTEM WEAPONS INDEX MESSAGE (SYS;WEAPONS) - CONTINUED

```
SYS;WEAPONS;C:___;        VERSION 740000 - XXXXXXXX

  1:155MM/M109A2           8:105MM/M102
  2:155MM/M109A3           9:105MM/M119
  3:155MM/HIP             10:8IN/M110A2
  4:155MM/M114A1          11:14.5MM/M31
  5:155MM/M114A2          12:DATABASE1  __/___/__ __/__/__ ______/______
  6:155MM/M198            13:DATABASE2  __/___/__ __/__/__ ______/______
  7:105MM/M101A1

SELECT:__;
```

9:105MM/M119

Choosing number 9 from the SYS;WEAPONS message indicates that the weapons used will be 105MM, model M119.

10:8INCH/M110A2

Choosing number 10 from the SYS;WEAPONS message indicates that the weapons used will be 8-inch, model M110A2.

11:14.5MM/M31

Choosing number 11 from the SYS;WEAPONS message indicates that the weapons used will be 14.5MM, model M31.

12:DATABASE1 DD/MMM/YY HH/MM/SS CAL___/WEAPON
13:DATABASE2 DD/MMM/YY HH/MM/SS CAL___/WEAPON

Choosing number 12 or 13 from the SYS;WEAPONS message restores one of the previously recorded data bases. The display will show the system time each data base was recorded by day, month, year, hour, minute, and second. It will also show the weapon caliber and model for the stored data base. If no data base exists for either index number 12 or 13, NO DATA BASE will be displayed next to the appropriate number(s).

4-9. SYSTEM WEAPONS INDEX MESSAGE (SYS;WEAPONS) - CONTINUED

SELECT:__;

SELECT is used to choose a weapon and model to be used for a new data base or to restore a previously recorded data base. If you enter the index number of a non-existent data base, an error message will be displayed.

g. Exploded View. Not applicable.

4-10. SYSTEM SETUP MESSAGE (SYS;SETUP) (NON-HIP)

a. Purpose. The SYS;SETUP message is used to enter data required to initialize a new data base or to display data entered from a previously recorded data base.

b. Source. The SYS;SETUP message is generated automatically by the BCS after the SYS;WEAPONS message is executed. It may also be displayed from the SYS;INDEX message.

c. Input. Input for the SYS;SETUP message is taken from your Operation Order (OPORD), unit Standing Operating Procedures (SOP's), Communication Electronics Operating Instructions (CEOI's), and Communication Electronics Standing Instructions (CESI's).

d. Computer Processing. Pressing the EXEC key causes the data in the SYS;SETUP message to be stored in the data base.

e. Output. The SYS;COMM message is automatically displayed after executing the SYS;SETUP message.

f. Message Format and Legal Entries. The following SYS;SETUP message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

```
SYS;SETUP;C:___;CALIBR:______;MODEL:______;
TIME:__/__/__;DATE:__/___/__;DRI:_;TGTNO:______/____;
METUSE:_;METUPD:_;METDEL:_;
ATP:_;MPOLL:_;PRINT:_/_;SCREEN:_;
CPHVTI:__;FSOXMIT:_/_/_/__/___;
GDUPREAM:___;BEEP:_;
```

SYS;SETUP; C:___;CALIBR:______;MODEL:______;

SYS;SETUP identifies the message as the system setup message.

SYS;SETUP; **C:___;** CALIBR:______;MODEL:______;

C indicates the security classification of the message. This is a computer generated entry. Legal entries are explained in appendix H.

Default = UN (unclassified)

4-10. SYSTEM SETUP MESSAGE (SYS;SETUP) (NON-HIP) - CONTINUED

SYS;SETUP;C:___; **CALIBR:_____;** MODEL:_____;

CALIBR indicates the weapon caliber being used. This is a protected field which you cannot change. The information in this field is entered by the BCS based on the entry you made in the SYS;WEAPONS message. Values displayed are:

105MM
155MM
8INCH
14.5MM

SYS;SETUP;C:___;CALIBR:_____; **MODEL:_____;**

MODEL indicates the weapon model being used. This is a protected field which you cannot change. The information in this field is entered by the BCS based on the entry you made in the SYS;WEAPONS message. The following table shows the values displayed for MODEL for each weapon caliber.

WEAPON CALIBER	MODEL
105MM	M101A1, M102, M119
155MM	M109A2, M109A3, M114A1, M114A2, M198
8INCH	M110A2
14.5MM	M31

TIME:__/__/__; DATE:__/___/__;DRI:_;TGTNO:_____/____;

TIME indicates the current system time. After the EXEC key is pressed, the time will appear on the middle display. This is an optional entry. When a previously recorded data base is loaded or the message is redisplayed, this field will be displayed as blanks. Legal entries are:

TIME:__/ __/__;	Hour	0 to 23
TIME:__/ **__/** __;	Minute	0 to 59
TIME:__/__/ **__;**	Second	0 to 59

Default = 00/00/00

4-10. SYSTEM SETUP MESSAGE (SYS;SETUP) (NON-HIP) - CONTINUED

```
SYS;SETUP;C:___;CALIBR:_____;MODEL:_____;
TIME:__/__/__;DATE:__/___/__;DRI:_;TGTNO:_____/____;
METUSE:_;METUPD:_;METDEL:_;
ATP:_;MPOLL:_;PRINT:_/_;SCREEN:_;
CPHVTI:__;FSOXMIT:_/_/_/__/___;
GDUPREAM:___;BEEP:_;
```

TIME:__/__/__; | DATE:__/___/__; | DRI:_;TGTNO:_____/____;

DATE indicates the current date. After the EXEC key is pressed, the date will appear on the middle display. This is an optional entry. When a previously recorded data base is loaded or the message is redisplayed, this field will be displayed as blanks. Legal entries are:

| DATE:__/ | ___/__;	Day	1 to 31
DATE:__/ | ___/ | __;	Month	First three letters of month name
DATE:__/___/ | __; |	Year	87 to 99

Default = 01/JAN/89

TIME:__/__/__;DATE:__/___/__; | DRI:_; | TGTNO:_____/____;

DRI causes the data base to be recorded on the tape in the TTU upon execution of the message. This field should not be used as part of initialization. You use this field only when your data base has been built and you wish to save it for later use. Refer to paragraph 6-26 for the procedure to record the data base. This is an optional entry. Legal entries are:

Blank - Do not record the data base
1 - Record over data base 1 (number 12 on SYS;WEAPONS message)
2 - Record over data base 2 (number 13 on SYS;WEAPONS message)
X - Record over current data base if a previously recorded data base was loaded or oldest data base if a weapon model was loaded

Default = Blank

4-10. SYSTEM SETUP MESSAGE (SYS;SETUP) (NON-HIP) - CONTINUED

TIME:__/__/__;DATE:__/___/__;DRI:_; **TGTNO:_____/____;**

TGTNO indicates the assigned target number block. An entry in this field will update the target block of the SYS;INDEX message. This is a required entry. Legal entries are:

TGTNO:_____/ ____;	Lowest target number of group	Two alphabetic and four numeric characters
TGTNO:_____/ **____;**	Highest target number of group	Four numeric characters

METUSE:_; METUPD:_;METDEL:_;

METUSE indicates which met message the BCS will use in computations. The MET indicated is transmitted or posted in the input queue whenever the SYS;SETUP message is updated. This is an optional entry. Legal entries are:

1 - computer met message 1
2 - computer met message 2
S - standard met

Default = S

METUSE:_; **METUPD:_;** METDEL:_;

METUPD indicates which met message will be updated when a new met message is received. This is an optional entry. Legal entries are:

1 - computer met message 1
2 - computer met message 2
Blank - do not update

Default = blank

4-10. SYSTEM SETUP MESSAGE (SYS;SETUP) (NON-HIP) - CONTINUED

```
SYS;SETUP;C:___;CALIBR:______;MODEL:______;
TIME:__/__/__;DATE:__/___/__;DRI:_;TGTNO:______/____;
METUSE:_;METUPD:_;METDEL:_;
ATP:_;MPOLL:_;PRINT:_/_;SCREEN:_;
CPHVTI:__;FSOXMIT:_/_/_/__/___;
GDUPREAM:___;BEEP:_;
```

METUSE:_;METUPD:_; **METDEL:_;**

METDEL indicates which met message will be deleted. This is an optional entry. Legal entries are:

1 - computer met message 1
2 - computer met message 2
Blank - do not delete

Default = blank

ATP:_; MPOLL:_;PRINT:_/_;SCREEN:_;

ATP indicates whether firing data will be sent automatically to relevant howitzers. Automatic transmission to howitzers is only possible for one mission at a time. This is an optional entry. Legal entries are:

Blank - manual transmission
X - automatic transmission

Default = blank

ATP:_; **MPOLL:_;** PRINT:_/_;SCREEN:_;

MPOLL indicates whether polling of howitzers will be automatic or manual. This is an optional entry. Legal entries are:

Blank - automatic polling
X - manual polling

Default = blank

4-10. SYSTEM SETUP MESSAGE (SYS;SETUP) (NON-HIP) - CONTINUED

ATP:_;MPOLL:_; **PRINT:_/_;** SCREEN:_;

PRINT indicates whether incoming and outgoing messages will be logged to a printer. This field is also used to purge the print queue. To purge the queue, erase any entries in this field and execute the message. If you wish to purge the print queue and there are no entries in this field, you must make an entry and execute the message. Redisplay the message, erase the entry, and reexecute the message. If there is no printer on-line, you cannot purge the print queue. This is an optional entry. Legal entries are:

PRINT:_/ _;	Incoming messages	X - print blank - do not print
PRINT:_/ **_;**	Outgoing messages	X - print blank - do not print

Default = blank

ATP:_;MPOLL:_;PRINT:_/_; **SCREEN:_;**

SCREEN indicates the amount of the plasma display screen that will be printed. This is an optional entry. Legal entries are:

X - print all of the plasma display
Blank - print only the lower plasma display

Default = blank

CPHVTI:__; FSOXMIT:_/_/_/__/___;

CPHVTI indicates the time interval between the commands to fire for Copperhead fire missions. If there are 12 GDU's on-line and the entry in GDUPREAM is 875, set the Copperhead timer to 30 or above. This is an optional entry. Legal entries are 20 to 60 seconds.

Default = 30 seconds

4-10. SYSTEM SETUP MESSAGE (SYS;SETUP) (NON-HIP) - CONTINUED

```
SYS;SETUP;C:___;CALIBR:______;MODEL:______;
TIME:__/__/__;DATE:__/___/__;DRI:_;TGTNO:______/____;
METUSE:_;METUPD:_;METDEL:_;
ATP:_;MPOLL:_;PRINT:_/_;SCREEN:_;
CPHVTI:__;FSOXMIT:_/_/_/__/___;
GDUPREAM:___;BEEP:_;
```

CPHVTI:__; **FSOXMIT:_/_/_/__/___;**

FSOXMIT indicates the Fire Support Officer's (FSO's) logical subscriber name for fire mission data. When an entry is made in this field, the BCS will select messages of interest and transmit them to the FSO without operator action. This is an optional entry for use during autonomous operations. Left-justify all entries. Legal entries are:

FSOXMIT:_/ _/_/__/___;	Section	One alphabetic or numeric character
FSOXMIT:_/ **_/** _/__/___;	Platoon	One alphabetic or numeric character
FSOXMIT:_/_/ **_/** __/___;	Battery	One alphabetic or numeric character
FSOXMIT:_/_/_/ **__/** ___;	Battalion	One or two alphabetic or numeric characters
FSOXMIT:_/_/_/__/ **___;**	Regiment	One to three alphabetic or numeric characters

Default = blank

4-10. SYSTEM SETUP MESSAGE (SYS;SETUP) (NON-HIP) - CONTINUED

GDUPREAM:___; BEEP:_;

GDUPREAM indicates the length of the preamble used by the BCS to key the radios to transmit messages to the howitzer. The preamble length is expressed in thousandths of a second. This is an optional entry. Legal entries are:

250 - .250 second
375 - .375 second
500 - .500 second
625 - .625 second
750 - .750 second
875 - .875 second

Default = 250

GDUPREAM:___; **BEEP:_;**

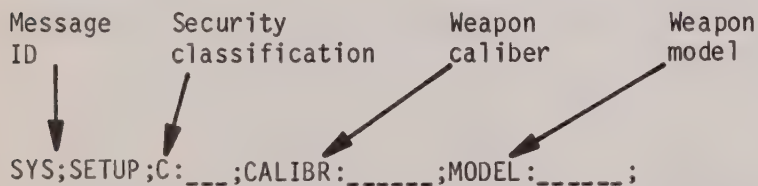
BEEP indicates whether a beep will sound whenever a keyboard character key is pressed. This is an optional entry. Legal entries are:

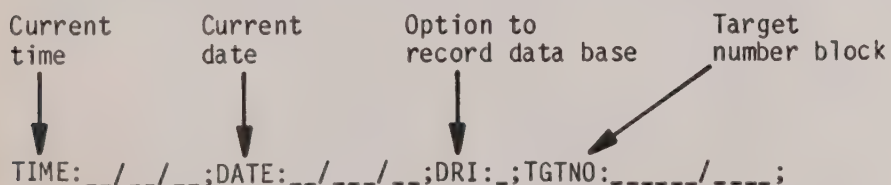
X - beep
Blank - no beep

Default = blank

---

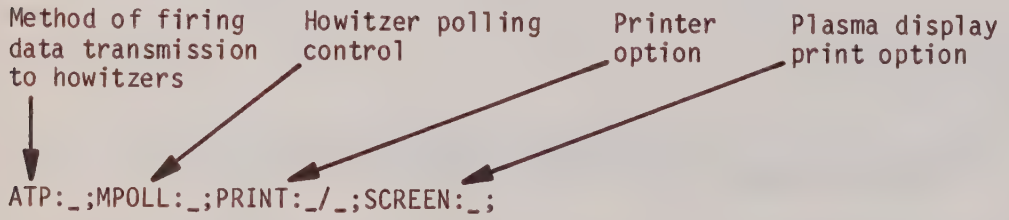
g. Exploded View. Use the following exploded view as a way to review the message.

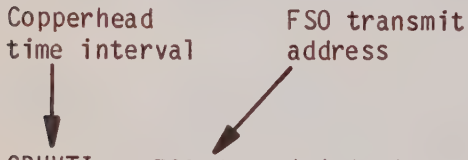


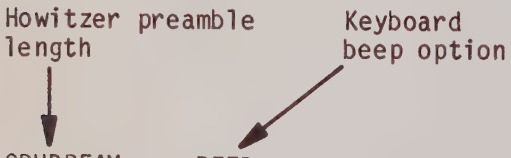


4-10. SYSTEM SETUP MESSAGE (SYS;SETUP) (NON-HIP) - CONTINUED

```
SYS;SETUP;C:___;CALIBR:______;MODEL:______;
TIME:__/__/__;DATE:__/___/__;DRI:_;TGTNO:______/____;
METUSE:_;METUPD:_;METDEL:_;
ATP:_;MPOLL:_;PRINT:_/_;SCREEN:_;
CPHVTI:__;FSOXMIT:_/_/_/__/___;
GDUPREAM:___;BEEP:_;
```







4-11. SYSTEM SETUP MESSAGE (SYS;SETUP) (HIP)

a. Purpose. The SYS;SETUP message is used to enter data required to initialize a new data base or to display data entered from a previously recorded data base.

b. Source. The SYS;SETUP message is generated automatically by the BCS after the SYS;WEAPONS message is executed. It may also be displayed from the SYS;INDEX message.

c. Input. Input for the SYS;SETUP message is taken from your Operation Order (OPORD), unit Standing Operating Procedures (SOP's), Communication Electronics Operating Instructions (CEOI's), and Communication Electronics Standing Instructions (CESI's).

d. Computer Processing. Pressing the EXEC key causes the data in the SYS;SETUP message to be stored in the data base.

e. Output. The SYS;COMM message is automatically displayed after executing the SYS;SETUP message.

f. Message Format and Legal Entries. The following SYS;SETUP message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

```
SYS;SETUP;C:___;CALIBR:______;MODEL:______;
TIME:__/__/__;DATE:__/___/__;DRI:_;TGTNO:______/____;
METUSE:_;METUPD:_;METDEL:_;MTOTMR:__;
PRINT:_/_;SCREEN:_;ATHFM:_;ATHDB:_;
CPHVTI:__;FSOXMIT:_/_/_/__/___;BEEP:_;
```

SYS;SETUP; C:___;CALIBR:______;MODEL:______;

SYS;SETUP identifies the message as the system setup message.

SYS;SETUP; **C:___;** CALIBR:______;MODEL:______;

C indicates the security classification of the message. This is a computer generated entry. Legal entries are explained in appendix H.

Default = UN (unclassified)

SYS;SETUP;C:___; **CALIBR:______;** MODEL:______;

CALIBR indicates the weapon caliber being used. This is a protected field which you cannot change. The information in this field is entered by the BCS based on the entry you made in the SYS;WEAPONS message. The value displayed is always 155MM.

4-11. SYSTEM SETUP MESSAGE (SYS;SETUP) (HIP) - CONTINUED

SYS;SETUP;C:___;CALIBR:_____; **MODEL:_____;**

MODEL indicates the weapon model being used. This is a protected field which you cannot change. The information in this field is entered by the BCS based on the entry you made in the SYS;WEAPONS message. The value displayed is always HIP.

TIME:__/__/__; DATE:__/___/__;DRI:_;TGTNO:_____/____;

TIME indicates the current system time. After the EXEC key is pressed, the time will appear on the middle display. This is an optional entry. When a previously recorded data base is loaded or the message is redisplayed, this field will be displayed as blanks. Legal entries are:

TIME:__/ __/__;	Hour	0 to 23
TIME:__/ **__/** __;	Minute	0 to 59
TIME:__/__/ **__;**	Second	0 to 59

Default = 00/00/00

TIME:__/__/__; **DATE:__/___/__;** DRI:_;TGTNO:_____/____;

DATE indicates the current date. After the EXEC key is pressed, the date will appear on the middle display. This is an optional entry. When a previously recorded data base is loaded or the message is redisplayed, this field will be displayed as blanks. Legal entries are:

DATE:__/ ___/__;	Day	1 to 31
DATE:__/ **___/** __;	Month	First three letters of month name
DATE:__/___/ **__;**	Year	87 to 99

Default = 01/JAN/89

4-11. SYSTEM SETUP MESSAGE (SYS;SETUP) (HIP) - CONTINUED

```
SYS;SETUP;C:___;CALIBR:_____;MODEL:_____;
TIME:__/__/__;DATE:__/___/__;DRI:_;TGTNO:_____/____;
METUSE:_;METUPD:_;METDEL:_;MTOTMR:__;
PRINT:_/_;SCREEN:_;ATHFM:_;ATHDB:_;
CPHVTI:__;FSOXMIT:_/_/_/__/___;BEEP:_;
```

TIME:__/__/__;DATE:__/___/__; **DRI:_;** TGTNO:_____/____;

DRI causes the data base to be recorded on the tape in the TTU upon execution of the message. This field should not be used as part of initialization. You use this field only when your data base has been built and you wish to save it for later use. Refer to paragraph 6-26 for the procedure to record the data base. This is an optional entry. Legal entries are:

Blank	- Do not record the data base
1	- Record over data base 1 (number 12 on SYS;WEAPONS message)
2	- Record over data base 2 (number 13 on SYS;WEAPONS message)
X	- Record over current data base if a previously recorded data base was loaded or oldest data base if a weapon model was loaded

Default = Blank

TIME:__/__/__;DATE:__/___/__;DRI:_; **TGTNO:_____/____;**

TGTNO indicates the assigned target number block. An entry in this field will update the target block of the SYS;INDEX message. This is a required entry. Legal entries are:

TGTNO:_____/ ____;	Lowest target number of group	Two alphabetic and four numeric characters
TGTNO:_____/ **____;**	Highest target number of group	Four numeric characters

---

4-11. SYSTEM SETUP MESSAGE (SYS;SETUP) (HIP) - CONTINUED

METUSE:_; METUPD:_;METDEL:_;MTOTMR:__;

METUSE indicates which met message the BCS will use in computations. The MET indicated is transmitted or posted in the input queue whenever the SYS;SETUP message is updated. This is an optional entry. Legal entries are:

1 - computer met message 1
2 - computer met message 2
S - standard met

Default = S

METUSE:_; **METUPD:_;** METDEL:_;MTOTMR:__;

METUPD indicates which met message will be updated when a new met message is received. This is an optional entry. Legal entries are:

1 - computer met message 1
2 - computer met message 2
Blank - do not update

Default = blank

METUSE:_;METUPD:_; **METDEL:_;** MTOTMR:__;

METDEL indicates which met message will be deleted. This is an optional entry. Legal entries are:

1 - computer met message 1
2 - computer met message 2
Blank - do not delete

Default = blank

METUSE:__;METUPD:__;METDEL:__; **MTOTMR:__;**

MTOTMR indicates the amount of time in seconds that will elapse after receipt of the last ACK in a fire mission before BCS automatically transmits an FM;MTO to the forward observer. This is an optional entry. Legal entries are 1 to 99.

Default = 20

4-11. SYSTEM SETUP MESSAGE (SYS;SETUP) (HIP) - CONTINUED

```
SYS;SETUP;C:___;CALIBR:_____;MODEL:_____;
TIME:__/__/__;DATE:__/__/__;DRI:_;TGTNO:_____/____;
METUSE:_;METUPD:_;METDEL:_;MTOTMR:__;
PRINT:_/_;SCREEN:_;ATHFM:_;ATHDB:_;
CPHVTI:__;FSOXMIT:_/_/_/__/___;BEEP:_;
```

PRINT:_/_; SCREEN:_;ATHFM:_;ATHDB:_;

PRINT indicates whether incoming and outgoing messages will be logged to a printer. This field is also used to purge the print queue. To purge the queue, erase any entries in this field and execute the message. If you wish to purge the print queue and there are no entries in this field, you must make an entry and execute the message. When the message is redisplayed, erase the entry and reexecute the message. If there is no printer on-line, you cannot purge the print queue. This is an optional entry. Legal entries are:

PRINT:_/ _;	Incoming messages	X - print blank - do not print
PRINT:_/ **_;**	Outgoing messages	X - print blank - do not print

Default = blank

PRINT:_/_; **SCREEN:_;** ATHFM:_;ATHDB:_;

SCREEN indicates the amount of the plasma display screen that will be printed. This is an optional entry. Legal entries are:

X - print all of the plasma display
Blank - print only the lower plasma display

Default = blank

PRINT:_/_;SCREEN:_; **ATHFM:_;** ATHDB:_;

ATHFM indicates that the fire mission messages (HOW;MSN and FM;COMNDS) will be automatically transmitted to the howitzers. This is an optional entry. Legal entries are:

Blank - manual transmission
X - automatic transmission

Default = blank

4-11. SYSTEM SETUP MESSAGE (SYS;SETUP) (HIP) - CONTINUED

PRINT:_/_;SCREEN:_;ATHFM:_; **ATHDB:_;**

ATHDB indicates that the data base messages (HOW;SBT, SPRT;MAP, MET;CM (METUSE field), and AFU;REG) will be automatically transmitted to the howitzers. This is an optional entry. Legal entries are:

Blank - manual transmission
X - automatic transmission

Default = blank

CPHVTI:__; FSOXMIT:_/_/_/__/___;BEEP:_;

CPHVTI indicates the time interval between the commands to fire for Copperhead fire missions. This is an optional entry. Legal entries are 20 to 60 seconds.

Default = 30 seconds

CPHVTI:__; **FSOXMIT:_/_/_/__/___;** BEEP:_;

FSOXMIT indicates the Fire Support Officer's (FSO's) logical subscriber name for fire mission data. When an entry is made in this field, the BCS will select messages of interest and transmit them to the FSO without operator action. This is an optional entry for use during autonomous operations. Left-justify all entries. Legal entries are:

FSOXMIT:_/ _/_/__/___;	Section	One alphabetic or numeric character
FSOXMIT:_/ **_/** _/__/___;	Platoon	One alphabetic or numeric character
FSOXMIT:_/_/ **_/** __/___;	Battery	One alphabetic or numeric character
FSOXMIT:_/_/_/ **__/** ___;	Battalion	One or two alphabetic or numeric characters
FSOXMIT:_/_/_/__/ **___;**	Regiment	One to three alphabetic or numeric characters

Default = blank

4-11. SYSTEM SETUP MESSAGE (SYS;SETUP) (HIP) - CONTINUED

```
SYS;SETUP;C:___;CALIBR:______;MODEL:______;
TIME:__/__/__;DATE:__/___/__;DRI:_;TGTNO:______/____;
METUSE:_;METUPD:_;METDEL:_;MTOTMR:__;
PRINT:_/_;SCREEN:_;ATHFM:_;ATHDB:_;
CPHVTI:__;FSOXMIT:_/_/_/__/___;BEEP:_;
```

```
CPHVTI:__;FSOXMIT:_/_/_/__/___;  BEEP:_;
```

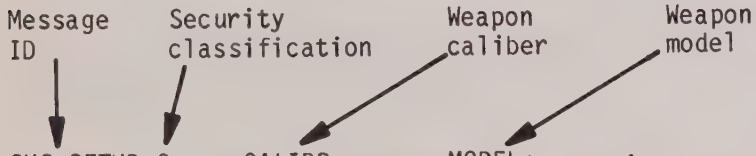
BEEP indicates whether a beep will sound whenever a keyboard character key is pressed. This is an optional entry. Legal entries are:

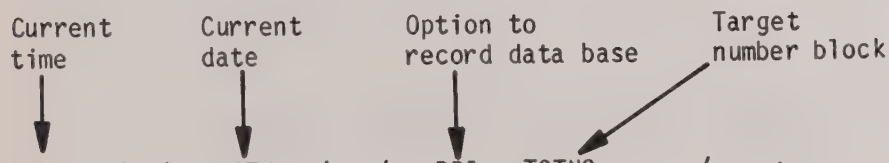
X - beep
Blank - no beep

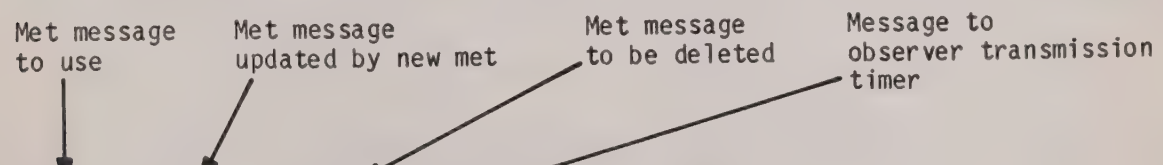
Default = blank

---

g. Exploded View. Use the following exploded view as a way to review the message.

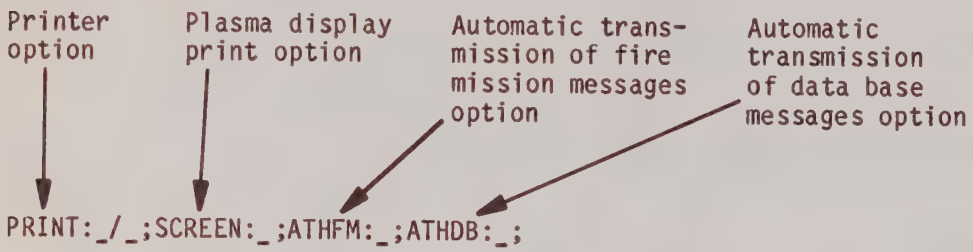





Met message to use
Met message updated by new met
Met message to be deleted
Message to observer transmission timer
METUSE:_;METUPD:_;METDEL:_;MTOTMR:_;

4-11. SYSTEM SETUP MESSAGE (SYS;SETUP) (HIP) - CONTINUED

```
SYS;SETUP;C:___;CALIBR:_____;MODEL:_____;
TIME:__/__/__;DATE:__/___/__;DRI:_;TGTNO:_____/____;
METUSE:_;METUPD:_;METDEL:_;MTOTMR:__;
PRINT:_/_;SCREEN:_;ATHFM:_;ATHDB:_;
CPHVTI:__;FSOXMIT:_/_/_/__/___;BEEP:_;
```


Printer option
Plasma display print option
Automatic transmission of fire mission messages option
Automatic transmission of data base messages option
PRINT:_/_;SCREEN:_;ATHFM:_;ATHDB:_;

4-12. SYSTEM COMMUNICATIONS MESSAGE (SYS;COMM)

a. Purpose. The SYS;COMM message is used to establish the communications characteristics of each comm channel.

b. Source. The SYS;COMM message is generated automatically by the BCS after the SYS;SETUP message is executed. It may also be displayed from the SYS;INDEX message.

c. Input. Input for the SYS;COMM message is taken from your OPORD, unit SOP, CEOI's, and CESI's.

d. Computer Processing. Pressing the EXEC key causes the data in the SYS;COMM message to be stored in the data base.

e. Output. The first segment of the SYS;SBT message is generated for display.

f. Message Format and Legal Entries. The following SYS;COMM message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

SYS;COMM;C:___;SYSTAT:___;FU:_/_/_/__/___;AUTH:_;
CH1;ADDR:_;DELAY:__;PREAM:__;RATE:__;MODE:_;FSK:_;CD:_;COMOVR:_;
CH2;ADDR:_;DELAY:__;PREAM:__;RATE:__;MODE:_;FSK:_;CD:_;COMOVR:_;

SYS;COMM; C:___;SYSTAT:___;FU:_/_/_/__/___;AUTH:_;

SYS;COMM identifies the message as the system communications message.

SYS;COMM; **C:___;** SYSTAT:___;FU:_/_/_/__/___;AUTH:_;

C indicates the security classification of the message. This is a computer generated entry. Legal entries are explained in appendix H.

Default = UN (unclassified)

SYS;COMM;C:___; **SYSTAT:___;** FU:_/_/_/__/___;AUTH:_;

SYSTAT indicates the status of the system. This is an optional entry. When displayed from the data base, it will be blank. Legal entries are:

ON
OFF

Default = OFF (on initial load of a weapon model)

4-12. SYSTEM COMMUNICATIONS MESSAGE (SYS;COMM) - CONTINUED

SYS;COMM;C:___;SYSTAT:___; **FU:_/_/_/__/___;** AUTH:_;

FU indicates your fire unit's logical subscriber name. Entries for battery, battalion, and regiment are required. Left-justify all entries. You cannot change the entries in this field if you are not in the initialization sequence with the HIP weapon model selected. This is a required entry. Legal entries are:

FU:_/ _/_/__/___;	Section	One alphabetic or numeric character, Blank (HIP)
FU:_/ **_/** _/__/___;	Platoon	One alphabetic or numeric character, 1 or 2 (HIP)
FU:_/_/ **_/** __/___;	Battery	One alphabetic or numeric character, A to Z (HIP)
FU:_/_/_/ **__/** ___;	Battalion	One or two alphabetic or numeric characters, 1 to 99 (HIP)
FU:_/_/_/__/ **___;**	Regiment	One or two alphabetic or numeric characters, 1 to 999 (HIP)

SYS;COMM;C:___;SYSTAT:___;FU:_/_/_/__/___; **AUTH:_;**

AUTH indicates whether authentication of messages is to be manual or automatic. Authentication override is used when there is no encryption available so that incoming messages can be automatically processed. This is an optional entry. Legal entries are:

Blank - manual authentication
X - automatic authentication

Default = blank

4-12. SYSTEM COMMUNICATIONS MESSAGE (SYS;COMM) - CONTINUED

```
SYS;COMM;C:___;SYSTAT:___;FU:_/_/_/__/___;AUTH:_;
CH1;ADDR:_;DELAY:__;PREAM:__;RATE:__;MODE:_;FSK:_;CD:_;COMOVR:_;
CH2;ADDR:_;DELAY:__;PREAM:__;RATE:__;MODE:_;FSK:_;CD:_;COMOVR:_;
```

CH1; ADDR:_;DELAY:__;PREAM:__;RATE:__;MODE:_;FSK:_;CD:_;COMOVR:_;
CH2; ADDR:_;DELAY:__;PREAM:__;RATE:__;MODE:_;FSK:_;CD:_;COMOVR:_;

CH1 and CH2 indicate that the information on these lines of the message relates to comm channel 1 or 2, respectively.

CH1; **ADDR:_;** DELAY:__;PREAM:__;RATE:__;MODE:_;FSK:_;CD:_;COMOVR:_;
CH2; **ADDR:_;** DELAY:__;PREAM:__;RATE:__;MODE:_;FSK:_;CD:_;COMOVR:_;

ADDR indicates the BCS source address for comm channel 1 or 2. This is a required entry. Unless directed to do otherwise, enter the same address for both channels. Legal entries are A through Z, 0 through 9, and the following special characters: +, -, &, #, ?, ., and *.

CH1;ADDR:_; **DELAY:__;** PREAM:__;RATE:__;MODE:_;FSK:_;CD:_;COMOVR:_;
CH2;ADDR:_; **DELAY:__;** PREAM:__;RATE:__;MODE:_;FSK:_;CD:_;COMOVR:_;

DELAY indicates the time between attempts to transmit on comm channels 1 or 2. The BCS will not transmit when the channel is busy. It will attempt to transmit again after the delay time. The range for delay time is 0 to 49.5 seconds. Values are entered in half-second increments. Therefore, you must double the length of the delay to determine the correct entry for the DELAY field. For example, if the delay time is 5 seconds, you must enter 10 in the DELAY field. This is an optional entry. Legal entries are 0 to 99.

Default = 1 (.5 second)

4-12. SYSTEM COMMUNICATIONS MESSAGE (SYS;COM) - CONTINUED

```
CH1;ADDR:_;DELAY:__;  [ PREAM:__; ]  RATE:__;MODE:_;FSK:_;CD:_;COMOVR:_;
CH2;ADDR:_;DELAY:__;  [ PREAM:__; ]  RATE:__;MODE:_;FSK:_;CD:_;COMOVR:_;
```

PREAM indicates the preamble length of messages for comm channel 1 or 2. The preamble is an invisible part of a message used by the computer to key the radios. The preamble is expressed in tenths of a second. This is an optional entry. Legal entries are:

2 - 0.2 second
7 - 0.7 second
14 - 1.4 seconds
21 - 2.1 seconds
28 - 2.8 seconds
40 - 4.0 seconds

Default = 2

```
CH1;ADDR:_;DELAY:__;PREAM:__;  [ RATE:__; ]  MODE:_;FSK:_;CD:_;COMOVR:_;
CH2;ADDR:_;DELAY:__;PREAM:__;  [ RATE:__; ]  MODE:_;FSK:_;CD:_;COMOVR:_;
```

RATE indicates the baud rate (speed at which data is transmitted) for comm channel 1 or 2. Baud rate is expressed in hundreds of bits per second. This is an optional entry. Legal entries are:

6 - 600 bits per second
12 - 1200 bits per second

Default = 12

```
CH1;ADDR:_;DELAY:__;PREAM:__;RATE:__;  [ MODE:_; ]  FSK:_;CD:_;COMOVR:_;
CH2;ADDR:_;DELAY:__;PREAM:__;RATE:__;  [ MODE:_; ]  FSK:_;CD:_;COMOVR:_;
```

MODE indicates the block mode for comm channel 1 or 2. This entry tells the computer whether to transmit each block of data once (single-block mode) or twice (double-block mode). This is an optional entry. Legal entries are:

1 - single-block mode
2 - double-block mode

Default = 1

4-12. SYSTEM COMMUNICATIONS MESSAGE (SYS;COM) - CONTINUED

```
SYS;COMM;C:___;SYSTAT:___;FU:_/_/_/__/___;AUTH:_;
CH1;ADDR:_;DELAY:__;PREAM:__;RATE:__;MODE:_;FSK:_;CD:_;COMOVR:_;
CH2;ADDR:_;DELAY:__;PREAM:__;RATE:__;MODE:_;FSK:_;CD:_;COMOVR:_;
```

```
CH1;ADDR:_;DELAY:__;PREAM:__;RATE:__;MODE:_;  FSK:_;  CD:_;COMOVR:_;
CH2;ADDR:_;DELAY:__;PREAM:__;RATE:__;MODE:_;  FSK:_;  CD:_;COMOVR:_;
```

FSK indicates the frequency shift keying when transmitting on comm channel 1 or 2. Frequency shift is expressed in cycles per second, or hertz (Hz). This is an optional entry. Legal entries are:

1 - 1200/2400 Hz
2 - 1300/2100 Hz

Default = 1

```
CH1;ADDR:_;DELAY:__;PREAM:__;RATE:__;MODE:_;FSK:_;  CD:_;  COMOVR:_;
CH2;ADDR:_;DELAY:__;PREAM:__;RATE:__;MODE:_;FSK:_;  CD:_;  COMOVR:_;
```

CD indicates the type of COMSEC device used for comm channel 1 or 2. This is an optional entry. When HIP is the weapon model, a KG-31 should never be used on a channel the howitzers are on. A KY-57 may be used on the channel the howitzers are using. Legal entries are:

Y - KY-57 COMSEC device
G - KG-31 COMSEC device
N - No COMSEC device

Default = N

```
CH1;ADDR:_;DELAY:__;PREAM:__;RATE:__;MODE:_;FSK:_;CD:_;  COMOVR:_;
CH2;ADDR:_;DELAY:__;PREAM:__;RATE:__;MODE:_;FSK:_;CD:_;  COMOVR:_;
```

COMOVR indicates communications override for comm channel 1 or 2. An entry in this field will allow the BCS to transmit messages even though the channel is busy. This capability can be used to override jamming or static on the channel. It should not be used to override digital traffic or to acquire priority use of the net. You should make an entry in this field only when directed to do so by your FDO. This is an optional entry. Legal entries are:

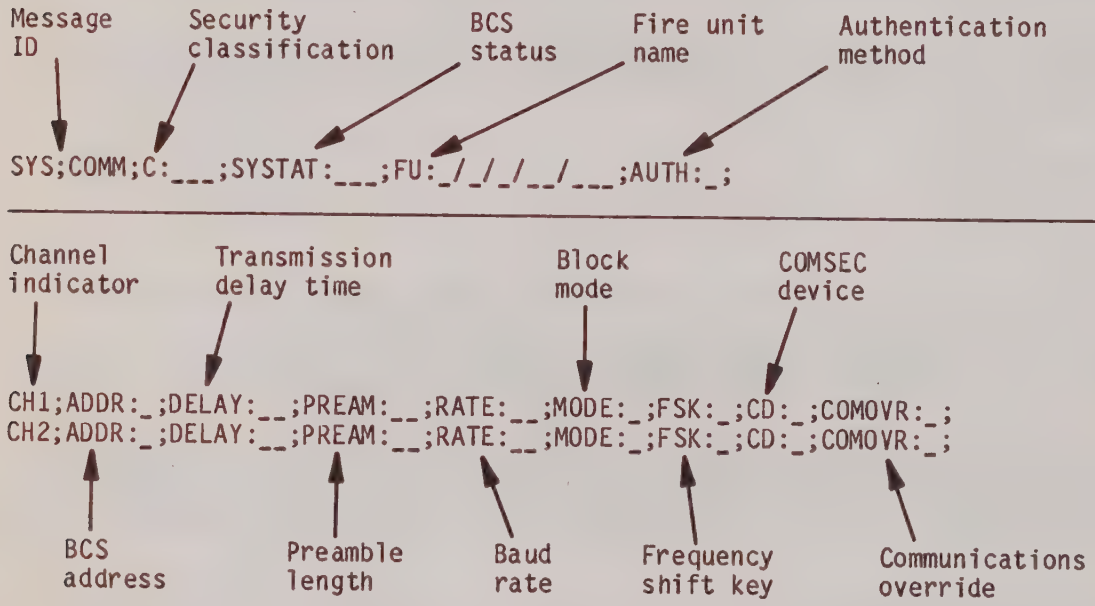
Blank - no override
X - communications override

Default = blank

4-12. SYSTEM COMMUNICATIONS MESSAGE (SYS;COM) - CONTINUED

```
SYS;COMM;C:___;SYSTAT:___;FU:_/_/_/__/___;AUTH:_;
CH1;ADDR:_;DELAY:__;PREAM:__;RATE:__;MODE:_;FSK:_;CD:_;COMOVR:_;
CH2;ADDR:_;DELAY:__;PREAM:__;RATE:__;MODE:_;FSK:_;CD:_;COMOVR:_;
```

g. Exploded View. Use the following exploded view as a way to review the message.



4-13. SYSTEM SUBSCRIBER TABLE MESSAGE (SYS;SBT)

a. Purpose. The SYS;SBT message is used to list all the subscribers who can legally send messages to you and receive messages from you. The SYS;SBT message is also used to check and update the message serial number.

b. Source. The SYS;SBT message is generated automatically after the SYS;COMM message is executed. It may also be displayed from the SYS;INDEX message. Use the NEXT SEG or PREV SEG key to display other segments of the message.

c. Input. Input for the SYS;SBT message is taken from your OPORD, unit SOP's, CEOI's, and CESI's. Data for 10 subscribers can be entered on one segment of the SYS;SBT message. By using 8 segments, data for 72 subscribers can be entered. When the eighth segment of the message is displayed, lines 14 through 21 will be displayed as blanks. When the weapon model is HIP, all howitzers must be on the same channel and have the same address. For the HIP weapon model if a howitzer is dedicated to an observer, either in a link or a relay, data for that howitzer must be entered into the SYS;SBT message twice. One entry in D (device type) must be H (howitzer) and the other entry in D must be R (relay or link).

d. Computer Processing. Pressing the EXEC key causes the data in the SYS;SBT message to be stored in the data base.

e. Output. The number of subscribers indicated by the SYS;INDEX message is updated. When you are initializing the system using a non-HIP weapon model selection, a SPRT;MAP message is displayed upon execution of the SYS;SBT message if the previous segment of the SYS;SBT message was not completely filled out. If the entire segment was filled out, a blank segment of the SYS;SBT message will be displayed upon execution of the SYS;SBT message. Press the NEXT SEG key to display the SPRT;MAP message.

When you are initializing the system using the HIP weapon model, a HOW;SBT message is displayed upon execution of the SYS;SBT message if the executed segment of the SYS;SBT message was not completely filled out. If the entire segment was filled out, a blank segment of the SYS;SBT message will be displayed upon execution of the SYS;SBT message. Press the NEXT SEG key to display the HOW;SBT message.

When you are restoring a previously recorded data base, the SYS;INDEX message is displayed upon execution of the SYS;SBT message if the previous segment of the SYS;SBT message was not completely filled out. If the entire segment was filled out, a blank segment of the SYS;SBT message will be displayed upon execution of the SYS;SBT message. Pressing the NEXT SEG key will display the SYS;INDEX message.

f. Message Format and Legal Entries. The following SYS;SBT message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

4-13. SYSTEM SUBSCRIBER TABLE MESSAGE (SYS;SBT) - CONTINUED

```
SYS;SBT;C:___;
01CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
02CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
03CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
04CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
05CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
06CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
07CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
08CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
09CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
10CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
```

SYS;SBT; C:___;

SYS;SBT identifies the message as the system subscriber table message.

SYS;SBT; **C:___;**

C indicates the security classification of the message. This is a computer generated entry. Legal entries are explained in appendix H.

Default = UN (unclassified)

NOTE

Line 01CA of the SYS;SBT message is described on the following pages. The description also applies to lines 02CA through 10CA.

01CA:_/_; L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;

01CA indicates the channel used and the subscriber address. This is a required entry. Legal entries are:

01CA:_/ _;	Channel used	1 or 2
01CA:_/ **_;**	Subscriber address	A to Z, 0 to 9, +, -, &, #, ?,.,*

4-13. SYSTEM SUBSCRIBER TABLE MESSAGE (SYS;SBT) - CONTINUED

O1CA:_/_; | L:_/_/_/__/___; | D:_;T:_;S:____/____;K:_;RLY:_;

L indicates the logical subscriber name. An entry in at least one subfield of this field is required for each subscriber. Left-justify all entries. Legal entries are:

| L:_/ | _/_/__/___;	Section	One alphabetic or numeric character; if the subscriber is a howitzer or relay, legal entries are 1 to 4
L:_/ | _/ | _/__/___;	Platoon	One alphabetic or numeric character; if the subscriber is a howitzer or relay, legal entries are 1 or 2
L:_/_/ | _/ | __/___;	Battery	One alphabetic or numeric character
L:_/_/_/ | __/ | ___;	Battalion, forward observer number, or FIST number	One or two alphabetic or numeric characters
L:_/_/_/__/ | ___; |	Regiment	One to three alphabetic or numeric characters

If you are entering an FO or a FIST into the fourth subfield, you may also enter FIS into the first three subfields or FO into the second and third subfields. The last three subfields must match the last three subfields of the FU field of the SYS;COMM message if the device type is H (howitzer) or R (relay).

4-13. SYSTEM SUBSCRIBER TABLE MESSAGE (SYS;SBT) - CONTINUED

```
SYS;SBT;C:__;
01CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
02CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
03CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
04CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
05CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
06CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
07CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
08CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
09CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
10CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
```

01CA:_/_;L:_/_/_/__/___; **D:_;** T:_;S:____/____;K:_;RLY:_;

D indicates the device type used by the subscriber. This is a required entry. Legal entries are:

- C - TACFIRE
- N - BCS
- T - TFDMD
- V - VFMED
- Z - FISTDMD
- F - Firefinder
- W - MDS
- A - RPV
- S - ATHS
- H - AFCS (HIP weapon only)
- R - AFCS Relay (HIP weapon only)

01CA:_/_;L:_/_/_/__/___;D:_; **T:_;** S:____/____;K:_;RLY:_;

T indicates the subscriber's status. It defines whether the subscriber is presently communicating with the BCS. You can also use this field to indicate that the subscriber is acting as a relay device. This is a required entry. Legal entries are:

- Y - Yes, the subscriber is communicating with the BCS.
- N - No, the subscriber is not communicating with the BCS.
- R - Relay on, the subscriber is acting as a relay device.

4-13. SYSTEM SUBSCRIBER TABLE MESSAGE (SYS;SBT) - CONTINUED

01CA:_/_;L:_/_/_/__/___;D:_;T:_; **S:____/____;** K:_;RLY:_;

S indicates the subscriber's message serial number. Normally, the BCS will automatically generate the entries for this field and you will make no entries into it. This is an optional entry. If you have to resynchronize (change over) serial numbers with a subscriber, you will make entries into this field. Refer to paragraph 3-24 for the procedure to resynchronize serial numbers. Legal entries are:

S:____/ ____;	Next serial number to be used in a message received from the subscriber identified in second subfield of the CA field	0 to 9999
S:____/ **____;**	Next serial number to be used in a message transmitted to the subscriber identified in the second subfield of the CA field	0 to 9999

Default = 0001

01CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____; **K:_;** RLY:_;

K indicates whether the subscriber has a COMSEC device in use. This is an optional entry. The entry in this field must be the same as the entry in the CD field of the SYS;COMM message for that channel. If the weapon model is HIP, the KG-31 cannot be used on the channel that the howitzers are on. Legal entries are:

Y - KY-57
G - KG-31
N - None

Default = N

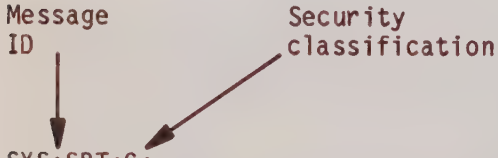
01CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_; **RLY:_;**

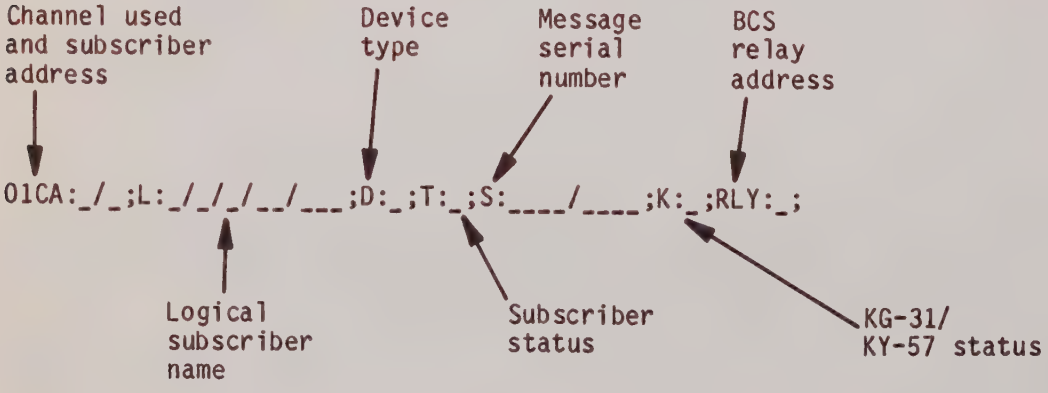
RLY indicates the relay address used to identify destination device when relay originates from a fixed-format device. If the entry in D is an R, do not make an entry in this field. This is an optional entry. Legal entries are A through Z, 0 through 9, and the special characters #, +, -, &, ., ?, *.

4-13. SYSTEM SUBSCRIBER TABLE MESSAGE (SYS;SBT) - CONTINUED

```
SYS;SBT;C:___;
01CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
02CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
03CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
04CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
05CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
06CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
07CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
08CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
09CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
10CA:_/_;L:_/_/_/__/___;D:_;T:_;S:____/____;K:_;RLY:_;
```

g. Exploded View. Use the following exploded view as a way to review the message.





4-14. HOWITZER SUBSCRIBER TABLE MESSAGE (HOW;SBT) (HIP)

a. Purpose. The HOW;SBT message is used to establish a subscriber table for each howitzer. Upon execution of the SYS;SBT message, one HOW;SBT message for each howitzer you entered will be displayed during the initialization sequence.

b. Source. During the initalization cycle, the HOW;SBT message is generated automatically after the SYS;SBT message is executed. It may also be displayed from the BCS;HSBSUM message. Use the NEXT SEG or PREV SEG key to display other segments of the message.

c. Input. Input for the HOW;SBT message is taken from your OPORD, unit SOP's, CEOI's, and CESI's. The entries in the FU field and on line A1 are computer generated from the entries you make in the SYS;COMM message. These entries are automatically updated when the SYS;COMM message is updated. Enter information for other howitzer subscribers on lines A2 through A5.

d. Computer Processing. There are always eight HOW;SBT messages in file. Pressing the EXEC key causes the data in the HOW;SBT message to be stored in the data base. If an entry is made in the SELECT field and the DELETE key is pressed, the selected subscriber shall be deleted from the subscriber file. If you have made an entry in the ATHDB field of the SYS;SETUP message, each HOW;SBT message will be automatically transmitted to the appropriate howitzers.

e. Output. If you did not make an entry in the ATHDB field of the SYS;SETUP message, the HOW;SBT message will be redisplayed requiring you to transmit it manually to the appropriate howitzers. If you are in the initialization sequence, the following will occur:

- If there is an entry in the ATHDB field of the SYS;SETUP message and the last segment of the HOW;SBT message has been processed, the next message in the sequence is displayed.
- If the ATHDB field of the SYS;SETUP message is blank, the updated HOW;SBT message is displayed.

If you are not in the initialization sequence, the following will occur:

- If there is an entry in the ATHDB field of the SYS;SETUP message, the SYS;INDEX message is displayed.
- If there is no entry in the ATHDB field of the SYS;SETUP message, the updated HOW;SBT message is displayed.

f. Message Format and Legal Entries. The following HOW;SBT message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

4-14. HOWITZER SUBSCRIBER TABLE MESSAGE (HOW;SBT) (HIP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;SBT;FU:_/_/_/__/___;
A1:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
A2:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
A3:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
A4:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
A5:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____
```

SELECT:__;

HOW;SBT; FU:_/_/_/__/___;

HOW;SBT identifies the message as the howitzer subscriber table message.

HOW;SBT; **FU:_/_/_/__/___;**

FU indicates the howitzer's logical name. This field is automatically filled in with the fire unit name that you entered in the SYS;COMM message. It is a protected entry which you cannot change. Values displayed by the computer are:

FU:_/ _/_/__/___;	Gun number	1 to 4
FU:_/ **_/** _/__/___;	Platoon	1 or 2
FU:_/_/ **_/** __/___;	Battery	A to Z
FU:_/_/_/ **__/** ___;	Battalion	1 to 99
FU:_/_/_/__/ **___;**	Regiment	1 to 999

. HOWITZER SUBSCRIBER TABLE MESSAGE (HOW;SBT) (HIP) - CONTINUED

:_; | L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;

ndicates the subscriber's physical address. BCS will complete this field with BCS physical address from the ADDR field of the SYS;COMM message. It is a ected entry which you cannot change. Values displayed are A through Z, 0 ugh 9, and the special characters +, -, &, #, ?, ., and *.

; | L:_/_/_/__/___; | D:_;T:_;K:_;S:____/____;

dicates the logical subscriber name. BCS will complete this field with the name he platoon BCS from the SYS;COMM message. It is a protected entry which you ot change. Values displayed are:

_/ | _/_/__/___;	Section	One alphabetic or numeric character
| _/ | _/__/___;	Platoon	One alphabetic or numeric character
_/ | _/ | __/___;	Battery	One alphabetic or numeric character
_/_/ | __/ | ___;	Battalion	One or two alphabetic or numeric characters
_/_/__/ | ___; |	Regiment	One to three alphabetic or numeric characters

_;L:_/_/_/__/___; | D:_; | T:_;K:_;S:____/____;

ndicates the type of device used by the subscribers. It is a protected entry ch you cannot change. BCS will enter N (BCS) as the device type.

4-14. HOWITZER SUBSCRIBER TABLE MESSAGE (HOW;SBT) (HIP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;SBT;FU:_/_/_/__/___;
A1:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
A2:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
A3:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
A4:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
A5:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;

SELECT:__;
```

A1:_;L:_/_/_/__/___;D:_; **T:_;** K:_;S:____/____;

T indicates the subscriber's status. It defines whether the subscriber is presently communicating with the howitzer. It is a protected entry which you cannot change. BCS will automatically enter the status from the SYSTAT field of the SYS;COMM message. Values displayed are:

Y - Yes, the subscriber is communicating with the howitzer
N - No, the subscriber is not communicating with the howitzer
R - Relay on, the subscriber is acting as a relay device

A1:_;L:_/_/_/__/___;D:_;T:_; **K:_;** S:____/____;

K indicates whether the subscriber has a COMSEC device in use. It is a protected entry which you cannot change. BCS will enter the status you entered in the CD field of the SYS;COMM message. Values displayed are:

Y - Yes, KY device is in use
N - No, device is not in use

4-14. HOWITZER SUBSCRIBER TABLE MESSAGE (HOW;SBT) (HIP) - CONTINUED

A1:_;L:_/_/_/__/___;D:_;T:_;K:_; **S:____/____;**

S indicates the subscriber's message serial number. This is a protected entry which you cannot change. Values displayed are:

S____/ ____;	Next serial number to be used in a message received from the subscriber	0 to 9999
S:____/ **____;**	Next serial number to be used in a message transmitted to the subscriber	0 to 9999

Default = 0001

NOTE

Line A2 of the HOW;SBT message is described on the following pages. The description also applies to lines A3 through A5.

A2:_; L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;

A2 indicates the subscriber's physical address. Legal entries are A through Z, 0 through 9, and the special characters +, -, &, #, ?, ., and *.

4-14. HOWITZER SUBSCRIBER TABLE MESSAGE (HOW;SBT) (HIP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;SBT;FU:_/_/_/__/___;
A1:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
A2:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
A3:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
A4:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
A5:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
```

SELECT:__;

A2:_; | L:_/_/_/__/___; | D:_;T:_;K:_;S:____/____;

L indicates the logical subscriber name. Left-justify all entries. Legal entries are:

| L:_/ | _/_/__/___;	Section	One alphabetic or numeric character
L:_/ | _/ | _/__/___;	Platoon	One alphabetic or numeric character
L:_/_/ | _/ | __/___;	Battery	One alphabetic or numeric character
L:_/_/_/ | __/ | ___;	Battalion	One or two alphabetic or numeric characters
L:_/_/_/__/ | ___; |	Regiment	One to three alphabetic or numeric characters

---

4-14. HOWITZER SUBSCRIBER TABLE MESSAGE (HOW;SBT) (HIP) - CONTINUED

A2:_;L:_/_/_/__/___; | D:_; | T:_;K:_;S:____/____;

D indicates the type of device used by the subscribers. This is a required entry. Legal entries are:

N - BCS
T - TFDMD
Z - FIST DMD
F - Firefinder
S - ATHS

A2:_;L:_/_/_/__/___;D:_; | T:_; | K:_;S:____/____;

T indicates the subscriber's status. It defines whether the subscriber is presently communicating with the howitzer. Legal entries are:

Y - Yes, the subscriber is communicating with the howitzer
N - No, the subscriber is not communicating with the howitzer
R - Relay on, the subscriber is acting as a relay device

A2:_;L:_/_/_/__/___;D:_;T:_; | K:_; | S:____/____;

K indicates whether the subscriber has a COMSEC device in use. Legal entries are:

Y - Yes, KY device is in use
N - No, device is not in use

A2:_;L:_/_/_/__/___;D:_;T:_;K:_; | S:____/____; |

S indicates the subscriber's message serial number. This is an optional entry. Legal entries are:

| S____/ | ____; — Next serial number to be used in a message received from the subscriber — 0 to 9999

S:____/ | ____; | — Next serial number to be used in a message transmitted to the subscriber — 0 to 9999

Default = 0001

4-14. HOWITZER SUBSCRIBER TABLE MESSAGE (HOW;SBT) (HIP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;SBT;FU:_/_/_/__/___;
A1:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
A2:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
A3:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
A4:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
A5:_;L:_/_/_/__/___;D:_;T:_;K:_;S:____/____;
```

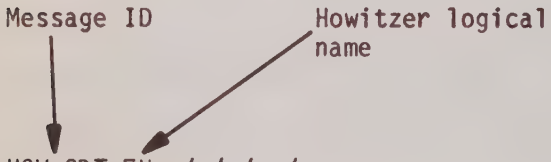
```
SELECT:__;
```

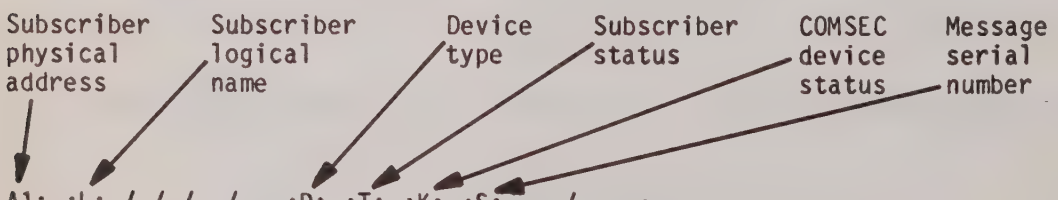
SELECT:__;

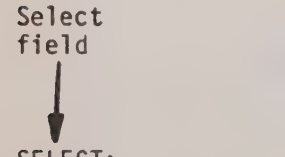
SELECT is used to delete subscriber information on lines A2 through A5. This is an optional entry. Legal entries are 2 to 5.

---

g. Exploded View. Use the following exploded view as a way to review the message.







4-15. MAP MODIFICATION INPUT MESSAGE (SPRT;MAP)

a. Purpose. The SPRT;MAP message defines to the BCS your area of operations in latitude and longitude or UTM grid coordinates. The map mod is limited to 100,000 meters by 100,000 meters. The difference between maximum and minimum eastings and northings cannot exceed 99,999 meters. (For the 14.5mm trainer, the difference between maximum and minimum eastings and northings cannot exceed 9,999 meters.) This message is used to enter, update, and transmit map mod data. Map mod data cannot be deleted. It can only be updated.

b. Source. The SPRT;MAP message is displayed during the initialization sequence when a weapon model is selected and from the following summary messages:

- BCS;DBSUM
- SYS;IQSUM.

c. Input. You enter data that defines the boundaries of your area of operations.

d. Computer Processing. The following paragraphs describe the processing that occurs for the SPRT;MAP message.

(1) Non-HIP Processing. Pressing the EXEC key causes the following processing:

- The data base is updated to reflect the coordinates entered into this message.
- Geographic coordinates are converted to UTM coordinates.

Pressing the XMIT key causes the following processing:

- SPRT;MAP message is transmitted to the specified subscriber.
- During initialization, the SPRT;MAP is deleted from the initialization sequence.

(2) HIP Processing. Pressing the EXEC key causes the following processing:

- The data base is updated to reflect the coordinates entered into this message.
- Geographic coordinates are converted to UTM coordinates.
- If an entry was made in the ATHDB field of the SYS;SETUP message, the SPRT;MAP message will be automatically transmitted to the appropriate howitzers.

e. Output. The following paragraphs describe the outputs that occur as a result of processing the SPRT;MAP message.

4-15. MAP MODIFICATION INPUT MESSAGE (SPRT;MAP) - CONTINUED

(1) Outputs for Non-HIP. The AFU;UPDATE message is automatically displayed during the intitialization sequence when a weapon model is selected.

(2) Outputs for HIP.

- During the initialization sequence, if there is an entry in the ATHDB field of the SYS;SETUP message, the AFU;UPDATE message is automatically displayed.
- If there is not an entry in the ATHDB field of the SYS;SETUP message, the SPRT;MAP message will be redisplayed for manual transmission to the appropriate howitzers.

f. Message Format and Legal Entries. The following SPRT;MAP message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SPRT;MAP;EAST:_____/_____;NORTH:_____/_____;GZ:___;SPHERE:_;
LATD:_/__/__/__._/_/__/__/__._;LONGD:_/___/__/__._/_/___/__/__._;
MAJX:_____.__;MINX:_____.__;GD:___;
```

| SPRT;MAP; | EAST:_____/_____;NORTH:_____/_____;GZ:___;SPHERE:_;

SPRT;MAP identifies the message as the map modification input message.

SPRT;MAP; | EAST:_____/_____; | NORTH:_____/_____;GZ:___;SPHERE:_;

EAST refers to the vertical boundaries of the map mod in UTM long coordinates. This is a conditional entry. Make entries into this field only if you are defining the map mod area by UTM long coordinates. Maximum differences cannot exceed 99,999 meters or 9,999 meters for the M31 weapon model. Legal entries are:

EAST:_____/ _____;	Easternmost edge in meters	0 to 999999
EAST:_____/ _____;	Westernmost edge in meters	0 to 999999

4-15. MAP MODIFICATION INPUT MESSAGE (SPRT;MAP) - CONTINUED

SPRT;MAP;EAST:_____/_____; **NORTH:_____/_____;** GZ:___;SPHERE:_;

NORTH refers to the horizontal boundaries of the map mod area in UTM long coordinates. This is a conditional entry. Make entries in this field only if you have made entries in the EAST field. Maximum differences cannot exceed 99,999 meters or 9,999 meters for the M31 weapon model. Legal entries are:

NORTH:_____/ _____;	Northernmost edge in meters	0 to 11000000
NORTH:_____/ **_____;**	Southernmost edge in meters	0 to 11000000

SPRT;MAP;EAST:_____/_____;NORTH:_____/_____; **GZ:___;** SPHERE:_;

GZ refers to the grid zone of the map. The grid zone entered is the grid zone of the lower left corner of the map mod area. This is a conditional entry. Make an entry in this field only if you made entries in the EAST and NORTH fields. Legal entries are -60 to +60, (excluding zero). (Plus (+) is for Northern Hemisphere. Minus (-) is for Southern Hemisphere.)

SPRT;MAP;EAST:_____/_____;NORTH:_____/_____;GZ:___; **SPHERE:_;**

SPHERE refers to the spheroid code of the map. The spheroid code entered is the spheroid code of the lower left corner of the map mod area. This is a required entry. Legal entries are 1 to 8. (Refer to appendix F for a more detailed explanation of the spheroid code legal entries.)

4-15. MAP MODIFICATION INPUT MESSAGE (SPRT;MAP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SPRT;MAP;EAST:_____/_____;NORTH:_____/_____;GZ:___;SPHERE:_;
LATD:_/__/__/__._/_/__/__/__._;LONGD:_/___/__/__._/_/___/__/__._;
MAJX:_____.__;MINX:_____.__;GD:___;
```

LATD:_/__/__/__._/_/__/__/__._; LONGD:_/___/__/__._/_/___/__/__._;

LATD refers to the horizontal boundaries of the map mod area in terms of latitude. The LATD and LONGD fields are used if you identify the map mod using latitude/longitude instead of UTM grid coordinates. This is a conditional entry. Make entries in this field only if you have not made entries in the EAST, NORTH, and GZ fields. Legal entries are:

LATD:_/__/__/__._/ _/__/__/__._; Enter data from the northernmost edge (top) into this set of subfields. Legal entries are:

LATD: _/ __/__/__._/	Direction from Equator	+ (north of Equator) or - (south of Equator)
LATD:_/ __/ __/__._/	Degrees	0 to 84
LATD:_/__/ __/ __._/	Minutes	0 to 59
LATD:_/__/__/ __._/	Seconds (to nearest tenth)	0 to 59.9

LATD:_/__/__/__._/ _/__/__/__._; Enter data for the southernmost edge (bottom) into this set of subfields. Legal entries are:

_/ __/__/__._;	Direction from equator	+ (north of Equator) or - (south of Equator)
_/ __/ __/__._;	Degrees	0 to 84
_/__/ __/ __._;	Minutes	0 to 59
_/__/__/ __._;	Seconds (to nearest tenth)	0 to 59.9

4-15. MAP MODIFICATION INPUT MESSAGE (SPRT;MAP) - CONTINUED

LATD:_/__/__/__._/_/__/__/__._; **LONGD:_/___/__/__._/_/___/__/__._;**

LONGD refers to the vertical boundaries of the map mod area in terms of longitude. This is a conditional entry. Make entries in this field only if you have made entries in the LATD field. Legal entries are:

LONGD:_/___/__/__._/ _/___/__/__._; Enter data for the easternmost edge (right) into this set of subfields. Legal entries are:

LONGD: **_/** ___/__/__._/	Direction from prime meridian	+ (east of prime meridian) or - (west of prime meridian)
LONGD:_/ **___/** __/__._/	Degrees	0 to 180
LONGD:_/___/ **__/** __._/	Minutes	0 to 59
LONGD:_/___/__/ **__._/**	Seconds (to nearest tenth)	0 to 59.9

LONGD:_/___/__/__._/ **_/___/__/__._;** Enter data for westernmost edge (left) into this set of subfields. Legal entries are:

_/ ___/__/__._;	Direction from prime meridian	+ (east of prime meridian) or - (west of prime meridian)
_/ **___/** __/__._;	Degrees	0 to 180
_/___/ **__/** __._;	Minutes	0 to 59
_/___/__/ **__._;**	Seconds (to nearest tenth)	0 to 59.9

4-15. MAP MODIFICATION INPUT MESSAGE (SPRT;MAP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SPRT;MAP;EAST:_____/_____;NORTH:_____/_____;GZ:___;SPHERE:_;
LATD:_/__/__/__._/_/__/__/__._;LONGD:_/___/__/__._/_/___/__/__._;
MAJX:_______.__;MINX:_______.__ɘGD:___;
```

MAJX:_____.__; MINX:_____.__ɘGD:___;

MAJX refers to the length in meters of the semi-major axis of the spheroid in a nonstandard spheroid. This is a conditional entry. Make an entry in this field only if you have entered the number 8 in the SPHERE field. Legal entries are 6350000.00 to 6380000.00.

MAJX:_____.__; **MINX:_____.__ɘ** GD:___;

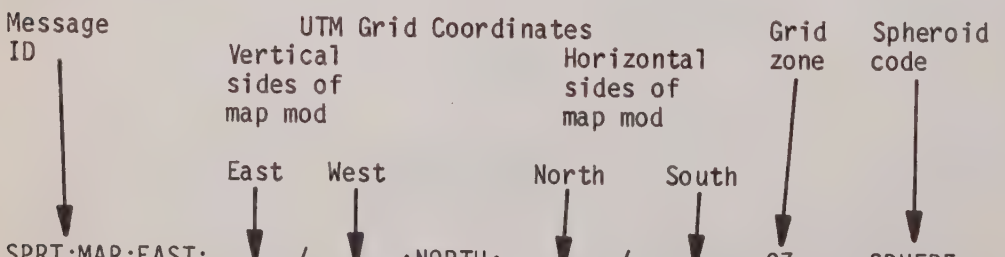
MINX refers to the length in meters of the semi-minor axis of the spheroid in a nonstandard spheroid. This is a conditional entry. Make an entry in this field only if you have made an entry in the MAJX field. Legal entries are 6350000.00 to 6380000.00.

MAJX:_____.__;MINX:_____.__ɘ **GD:___;**

GD refers to the grid declination of the map mod. It is measured from grid north to true north. The resulting angle represents the difference between grid north and true north. This is a required entry. GD must be entered in tens of mils. (For example, if the grid declination is 20, you must enter a 2.) The correct sign must also be entered (+ or -). If the correct grid declination is not available, your FDO may direct you to enter a zero. If you later change the entry, the met wind direction is changed. Legal entries are -50 to +50.

---

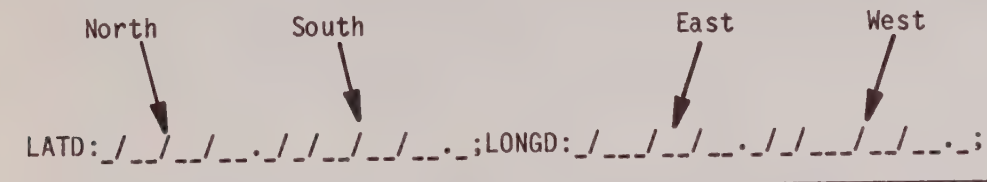
g. Exploded View. Use the following exploded view as a way to review the message.

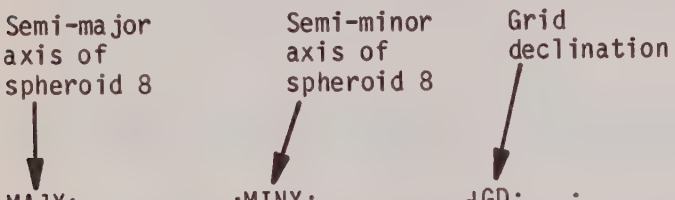


4-15. MAP MODIFICATION INPUT MESSAGE (SPRT;MAP) - CONTINUED

Latitude and Longitude of Map Mod:

Horizontal sides of map mod — Vertical sides of map mod





4-16. AMMUNITION AND FIRE UNIT UPDATE MESSAGE (AFU;UPDATE)

a. Purpose. The AFU;UPDATE message is used to enter, update, and transmit fire unit data required in fire mission processing.

b. Source. The AFU;UPDATE message is displayed during the initialization sequence when a weapon model is selected and from the following summary messages:

- BCS;DBSUM
- SYS;IQSUM.

c. Input. You enter fire unit data needed for fire mission processing.

d. Computer Processing. Pressing the EXEC key causes the fire unit file to be updated.

e. Output. For a non-HIP weapon, the BCS;PIECES message is generated for display. For the HIP weapon, the AFU;UPDATE message is redisplayed with a warning message indicating that there are no HOW;UPDATE messages in file.

f. Message Format and Legal Entries. The following AFU;UPDATE message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;UPDATE;FU:_/_/_/__/___;WPN:_____;MODEL:_____;MSN:___;ZONE:_____;
COORD:_____/_____/_____;GZ:___;SPHERE:_;FULAT:___._;DTG:__/__/__;
APL:_/_/_;WSTR:__;AZ:____;ST:_;DF:____;PTEMP:____;RT:_;RS:_;TIMEØ:___;
MAXRTE:__._;SUSRTE:__._;MAXEL:____;TRAVLR:____/____;BPLOC:_/___/_/___;
MINRNG:_____;MAXRNG:_/____,_/____,_/____,_/____,_/____;
READY:_;OUTTIL:__/__/__;UREINF:_/_/_/__/___;DELETE:_
ORSTA:_____/_____/_____;ORSTAGZ:___;ORSTASPH:_;
ORSTB:_____/_____/_____;ORSTBGZ:___;ORSTBSPH:_;
```

AFU;UPDATE;	FU:_/_/_/__/___;WPN:_____;MODEL:_____;MSN:___;ZONE:_____;

AFU;UPDATE identifies the message as the ammunition and fire unit update input message.

4-16. AMMUNITION AND FIRE UNIT UPDATE INPUT MESSAGE (AFU;UPDATE) - CONTINUED

AFU;UPDATE; **FU:_/_/_/__/___;** WPN:_____;MODEL:_____;MSN:___;ZONE:_____;

FU indicates the fire unit name of the BCS. Upon execution, this field is automatically filled in by the BCS with the fire unit or platoon name you entered in the FU field of the SYS;COMM message. It is a protected entry which you cannot change. Values displayed by the computer are:

FU:_/ _/__/___;	Section	One alphabetic or numeric character, Blank (HIP)
FU:_/ **_/** _/__/___;	Platoon	One alphabetic or numeric character, 1 or 2 (HIP)
FU:_/_/ **_/** __/___;	Battery	One alphabetic or numeric character, A to Z (HIP)
FU:_/_/_/ **__/** ___;	Battalion	One or two alphabetic or numeric characters, 1 to 99 (HIP)
FU:_/_/_/__/ **___;**	Regiment	One to three alphabetic or numeric characters, 1 to 999 (HIP)

AFU;UPDATE;FU:_/_/_/__/___; **WPN:_____;** MODEL:_____;MSN:___;ZONE:_____;

WPN indicates the weapon type. It is a protected entry which you cannot change. It is automatically filled in by the BCS with the weapon type you chose from the SYS;WEAPONS message or the weapon type for the data base you restored. Values displayed are one to six alphanumeric characters. (Refer to appendix F for more information about weapon types.)

AFU;UPDATE;FU:_/_/_/__/___;WPN:_____; **MODEL:_____;** MSN:___;ZONE:_____;

MODEL indicates the weapon model. It is a protected entry which you cannot change. It is automatically filled in by the BCS with the weapon model number you chose from the SYS;WEAPONS message or the weapon model number for the data base you restored. Values displayed are one to six alphanumeric characters. (Refer to appendix F for more information about weapon model numbers.)

4-16. AMMUNITION AND FIRE UNIT UPDATE INPUT MESSAGE (AFU;UPDATE) - CONTINUED

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;UPDATE;FU:_/_/_/__/___;WPN:______;MODEL:______;MSN:___;ZONE:______;
CORD:_____/_______/_____;GZ:___;SPHERE:_;FULAT:___._;DTG:__/__/__;
APL:_/_/_;WSTR:__;AZ:____;ST:_;DF:____;PTEMP:____;RT:_;RS:_;TIMEØ:___;
MAXRTE:__._;SUSRTE:__._;MAXEL:____;TRAVLR:____/____;BPLOC:_/___/_/___;
MINRNG:_____;MAXRNG:_/____,_/____,_/____,_/____,_/____;
READY:_;OUTTIL:__/__/__;UREINF:_/_/_/__/___;DELETE:_ⅎ
ORSTA:_____/_______/_____;ORSTAGZ:___;ORSTASPH:_;
ORSTB:_____/_______/_____;ORSTBGZ:___;ORSTBSPH:_;
```

AFU;UPDATE;FU:_/_/_/__/___;WPN:______;MODEL:______; **MSN:___;** ZONE:______;

MSN indicates the mission of the fire unit. The mission you enter is stored in the data base, but is not used by BCS. It is for information only. This is a required entry. Legal entries are:

DS - direct support
R - reinforcing
GSR - general support reinforcing
GS - general support

AFU;UPDATE;FU:_/_/_/__/___;WPN:______;MODEL:______;MSN:___; **ZONE:______;**

ZONE indicates the name of your zone of responsibility. This data is stored in the data base, but is not used by BCS. It is for information only. This is a required entry. Legal entries are A to Z, 0 through 9, and the special characters except for the following /, @, ⅎ, :, ;, ., and ,.

4-16. AMMUNITION AND FIRE UNIT UPDATE INPUT MESSAGE (AFU;UPDATE) - CONTINUED

CORD:_____/_____/_____; GZ:___;SPHERE:_;FULAT:___._;DTG:__/__/__;

CORD indicates the fire unit coordinates for non-HIP weapons and the platoon center coordinates for the HIP weapon.

For a non-HIP weapon model, the BCS displays these coordinates by computing the mathematical average of the locations of all active howitzers in the BCS;PIECES message. The data in the CORD field is updated upon execution of the BCS;PIECES message.

For the HIP weapon, the BCS displays these coordinates by computing the mathematical average of the locations of all howitzers in the HOW;UPDATE messages. If you have not made an entry in the ORSTA field and there is at least one HOW;UPDATE message in file with an entry of S, Y, L, or R, the entries in the CORD fields of those HOW;UPDATE messages in file will be averaged and the result entered into the CORD field of the AFU;UPDATE message. If there is no entry in the AZ field, it will be entered with the average of the AZ fields of HOW;UPDATE messages in file with an entry in the STATUS field of S, Y, L, or R. If you have not made an entry in the ORSTA field and there are no HOW;UPDATE messages in file or no HOW;UPDATE messages in file with an entry in the STATUS field of S, Y, L, or R, the CORD and FULAT fields of the AFU;UPDATE message will contain zeros. If you have made an entry in the ORSTA field, the BCS will place that entry in the CORD field upon execution.

This is a computer generated entry. It is a protected entry which you cannot change. Values displayed by the computer are:

CORD:_____/ _____/_____;	Easting in meters	0 to 999999
CORD:_____/ **_____/** _____;	Northing in meters	0 to 11000000
CORD:_____/_____/ **_____;**	Altitude in meters	-9999 to +9999

CORD:_____/_____/_____; **GZ:___;** SPHERE:_;FULAT:___._;DTG:__/__/__;

GZ indicates the grid zone of the fire unit coordinates. This entry is made by the BCS upon execution of the BCS;PIECES message when the weapon is non-HIP or the HOW;UPDATE message for the HIP weapon. It is a protected entry which you cannot change. Values displayed are -60 to +60 (excluding zero).

Default = orienting station grid zone as entered in ORSTAGZ.

4-16. AMMUNITION AND FIRE UNIT UPDATE INPUT MESSAGE (AFU;UPDATE) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;UPDATE;FU:_/_/_/__/___;WPN:_____;MODEL:_____;MSN:___;ZONE:_____;
CORD:_____/_______/_____;GZ:___;SPHERE:_;FULAT:___._;DTG:__/__/__;
APL:_/_/_;WSTR:__;AZ:____;ST:_;DF:____;PTEMP:____;RT:_;RS:_;TIMEØ:___;
MAXRTE:__._;SUSRTE:__._;MAXEL:____;TRAVLR:____/____;BPLOC:_/___/_/___;
MINRNG:____;MAXRNG:_/____,_/____,_/____,_/____,_/____;
READY:_;OUTTIL:__/__/__;UREINF:_/_/_/__/___;DELETE:_
ORSTA:_____/_______/_____;ORSTAGZ:___;ORSTASPH:_;
ORSTB:_____/_______/_____;ORSTBGZ:___;ORSTBSPH:_;
```

CORD:_____/_______/_____;GZ:___; **SPHERE:_;** FULAT:___._;DTG:__/__/__;

SPHERE indicates the spheroid code of the fire unit coordinates. This entry is made by the BCS upon execution of the BCS;PIECES message when the weapon is non-HIP or the HOW;UPDATE for the HIP weapon. It is a protected entry which you cannot change. Values displayed are 1 to 8.

Default = map mod spheroid code as entered in SPRT;MAP message.

CORD:_____/_______/_____;GZ:___;SPHERE:_; **FULAT:___._;** DTG:__/__/__;

FULAT indicates the latitude of the fire unit in degrees. This data is used to compute coriolis coefficients and gravity constant. The entry in FULAT is recomputed whenever the entry in CORD is recomputed. This is a computer generated entry. It is a protected entry which you cannot change. Values displayed are -90.0 to +90.0.

CORD:_____/_______/_____;GZ:___;SPHERE:_;FULAT:___._; **DTG:__/__/__;**

DTG indicates the date and time of the message. This data is stored in the data base. This is a computer generated entry which may be changed by the operator. Legal entries are:

DTG:__/ __/__;	Day	1 to 31
DTG:__/ **__/** __;	Hour	0 to 23
DTG:__/__/ **__;**	Minute	0 to 59

Default = current system time

4-16. AMMUNITION AND FIRE UNIT UPDATE INPUT MESSAGE (AFU;UPDATE) - CONTINUED

APL:_/_/_; WSTR:__;AZ:____;ST:_;DF:____;PTEMP:____;RT:_;RS:_;TIMEØ:___;

APL indicates the ammunition authorized for use by the fire unit. You can enter one ammunition type in each subfield. If you make an entry in the second subfield, you must make an entry in the first subfield. This data is stored in the data base but is not used by BCS. It is for information only. This is a required entry. Legal entries are:

H - high explosive
C - chemical
N - nuclear

APL:_/_/_; **WSTR:__;** AZ:____;ST:_;DF:____;PTEMP:____;RT:_;RS:_;TIMEØ:___;

WSTR indicates weapon strength (number of tubes). This data is stored in the data base but is not used by BCS. It is for information only. This is a required entry. Legal entries are 0 to 99.

APL:_/_/_;WSTR:__; **AZ:____;** ST:_;DF:____;PTEMP:____;RT:_;RS:_;TIMEØ:___;

AZ indicates the azimuth of fire in mils. This data is stored in the data base and is used to determine firing deflection. For the HIP weapon model, if you make an entry in ORSTA, you must make an entry in AZ. This is a required entry for non-HIP weapons. Legal entries are 0 to 6399.

Default = 0 (HIP weapon)

APL:_/_/_;WSTR:__;AZ:____; **ST:_;** DF:____;PTEMP:____;RT:_;RS:_;TIMEØ:___;

ST indicates the type of sight. This data is stored in the data base and is used to determine the referred deflection. This is a conditional entry. You must make an entry in this field if the entry in MODEL is M31. Legal entries are:

1 - 3200 mils
2 - 6400 mils

Default = 1 (M114A1, M144A2, and M101A1),
2 (M109A2, M109A3, M198, M102, M119, M110A2, and XM284),
No default (M31)

4-16. AMMUNITION AND FIRE UNIT UPDATE INPUT MESSAGE (AFU;UPDATE) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;UPDATE;FU:_/_/_/__/___;WPN:_____;MODEL:_____;MSN:___;ZONE:_____;
CORD:_____/_____/_____;GZ:___;SPHERE:_;FULAT:___._;DTG:__/__/__;
APL:_/_/_;WSTR:__;AZ:____;ST:_;DF:____;PTEMP:____;RT:_;RS:_;TIMEØ:___;
MAXRTE:__._;SUSRTE:__._;MAXEL:____;TRAVLR:____/____;BPLOC:_/___/_/___;
MINRNG:_____;MAXRNG:_/____,_/____,_/____,_/____,_/____;
READY:_;OUTTIL:__/__/__;UREINF:_/_/_/__/___;DELETE:_;
ORSTA:_____/_____/_____;ORSTAGZ:___;ORSTASPH:_;
ORSTB:_____/_____/_____;ORSTBGZ:___;ORSTBSPH:_;
```

APL:_/_/_;WSTR:__;AZ:____;ST:_; **DF:____;** PTEMP:____;RT:_;RS:_;TIMEØ:___;

DF indicates the referred deflection in mils. This data is stored in the data base or may be entered by the operator. This is a conditional entry. You must make an entry in this field if the entry in MODEL is M31. Legal entries are 0 to 6399 mils.

Default = 2400 (M114A1 and M114A2),
2800 (M101A1),
3200 (M109A2, M109A3, M198, M102, M119, XM284, and M110A2),
No default (M31)

APL:_/_/_;WSTR:__;AZ:____;ST:_;DF:____; **PTEMP:____;** RT:_;RS:_;TIMEØ:___;

PTEMP indicates powder temperature in degrees Fahrenheit. This data is stored in the data base and is used to compute ballistic inputs. This is an optional entry. Legal entries are -130 to +145.

Default = 70

APL:_/_/_;WSTR:__;AZ:____;ST:_;DF:____;PTEMP:____; **RT:_;** RS:_;TIMEØ:___;

RT indicates the fire unit's reaction time in minutes. This data is stored in the data base but not used by BCS. It is for information only. This is an optional entry. Legal entries are 0 to 9.

Default = 2 (M110A2)
1 (all others)

4-16. AMMUNITION AND FIRE UNIT UPDATE INPUT MESSAGE (AFU;UPDATE) - CONTINUED

APL:_/_/_;WSTR:__;AZ:____;ST:_;DF:____;PTEMP:____;RT:_; **RS:_;** TIMEØ:___;

RS indicates radiation status. This data is stored in the data base but is not used by BCS. It is for information only. This is an optional entry. Legal entries are 0 to 3. (The procedure for determining the correct RS value is defined in FM 3-12.)

APL:_/_/_;WSTR:__;AZ:____;ST:_;DF:____;PTEMP:____;RT:_;RS:_; **TIMEØ:___;**

TIMEØ indicates the nuclear response time. This data is stored in the data base but is not used by BCS. It is for information only. This is an optional entry. Legal entries are 0 to 999.

MAXRTE:__._; SUSRTE:__._;MAXEL:____;TRAVLR:____/____;BPLOC:_/___/_/___;

MAXRTE indicates the maximum rate of fire in rounds per minute to the nearest tenth of a round. This data is stored in the data base but is not used by BCS. It is for information only. This is an optional entry. Legal entries are 0 to 99.9.

Default = 4.0 (155mm and 14.5mm), 10.0 (105mm), and 1.5 (203mm)

MAXRTE:__._; **SUSRTE:__._;** MAXEL:____;TRAVLR:____/____;BPLOC:_/___/_/___;

SUSRTE indicates the sustained rate of fire in rounds per minute to the nearest tenth of a round. This data is stored in the data base but is not used by BCS. It is for information only. This is an optional entry. Legal entries are 0 to 99.9.

Default = 1.0 (155mm), 3.0 (105mm), 0.5 (203mm), and 2.0 (14.5mm)

MAXRTE:__._;SUSRTE:__._; **MAXEL:____;** TRAVLR:____/____;BPLOC:_/___/_/___;

MAXEL indicates the maximum elevation in mils. This data is stored in the data base and is used to check the computed quadrant elevation for a limit violation. This is an optional entry. Legal entries are 0 to 1600.

Default = 1156 (M114A1, M114A2, M101A1, and M110A2),
1244 (M119),
1275 (M198 and XM284),
1333 (M109, M109A2, M109A3, M102, and M31)

4-16. AMMUNITION AND FIRE UNIT UPDATE INPUT MESSAGE (AFU;UPDATE) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;UPDATE;FU:_/_/_/__/___;WPN:_____;MODEL:_____;MSN:___;ZONE:_____;
CORD:_____/_____/_____;GZ:___;SPHERE:_;FULAT:___._;DTG:__/__/__;
APL:_/_/_;WSTR:__;AZ:____;ST:_;DF:____;PTEMP:____;RT:_;RS:_;TIMEØ:___;
MAXRTE:__._;SUSRTE:__._;MAXEL:____;TRAVLR:____/____;BPLOC:_/___/_/___;
MINRNG:_____;MAXRNG:_/____,_/____,_/____,_/____,_/____;
READY:_;OUTTIL:__/__/__;UREINF:_/_/_/__/___;DELETE:_┘
ORSTA:_____/_____/_____;ORSTAGZ:___;ORSTASPH:_;
ORSTB:_____/_____/_____;ORSTBGZ:___;ORSTBSPH:_;
```

MAXRTE:__._;SUSRTE:__._;MAXEL:____; **TRAVLR:____/____;** BPLOC:_/___/_/___;

TRAVLR indicates the traverse limits in mils. This data is stored in the data base and is used to check the computed deflection for a limit violation. This is an optional entry. Legal entries are:

TRAVLR:____/ ____;	Left	0 to 6399
TRAVLR:____/ ____;	Right	0 to 6399

Defaults are:

Weapon Model	Default Traverse Limit
M198	400/400
M101A1	400/409
M114A1, M114A2	418/448
M110A2	533/533
M109A2, M109A3, M102, M119, XM284, M31	6399/6399

4-16. AMMUNITION AND FIRE UNIT UPDATE INPUT MESSAGE (AFU;UPDATE) - CONTINUED

MAXRTE:__._;SUSRTE:__._;MAXEL:____;TRAVLR:____/____; **BPLOC:_/___/_/___;**

BPLOC indicates the base howtizer location relative to battery center. This data is stored in the data base but is not used by BCS. It is for information only. This is an optional entry. Legal entries are:

BPLOC:_/ ___/_/___;	Direction from battery (platoon (HIP)) center	B (back) F (front)
BPLOC:_/ **___/** _/___;	Number of meters	0 to 999
BPLOC:_/___/ **_/** ___;	Direction from battery (platoon (HIP)) center	L (left) R (right)
BPLOC:_/___/_/ **___;**	Number of meters	0 to 999

Default = F/0/R/0

MINRNG:_____; MAXRNG:_/____,_/____,_/____,_/____,_/____;

MINRNG indicates the minimum range in tens of meters. This data is stored in the data base and is used to process checks on range. This is an optional entry. Legal entries are 1 to 999.

Default = 1

4-16. AMMUNITION AND FIRE UNIT UPDATE INPUT MESSAGE (AFU;UPDATE) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;UPDATE;FU:_/_/_/__/___;WPN:_____;MODEL:_____;MSN:___;ZONE:_____;
CORD:_____/_______/_____;GZ:___;SPHERE:_;FULAT:___._;DTG:__/__/__;
APL:_/_/_;WSTR:__;AZ:____;ST:_;DF:____;PTEMP:____;RT:_;RS:_;TIMEØ:___;
MAXRTE:__._;SUSRTE:__._;MAXEL:____;TRAVLR:____/____;BPLOC:_/___/_/___;
MINRNG:_____;MAXRNG:_/____,_/____,_/____,_/____,_/____;
READY:_;OUTTIL:__/__/__;UREINF:_/_/_/__/___;DELETE:_┘
ORSTA:_____/_______/_____;ORSTAGZ:___;ORSTASPH:_;
ORSTB:_____/_______/_____;ORSTBGZ:___;ORSTBSPH:_;
```

MINRNG:_____; **MAXRNG:_/____,_/____,_/____,_/____,_/____;**

MAXRNG indicates ammunition identity and its maximum range in tens of meters. A maximum of five iterations may be entered. This is an optional entry. Legal entries for each iteration are:

MAXRNG:_/ ____,	Identity	1 = HE normal 2 = HE extended 3 = CH normal 4 = NUC extended 5 = NUC
MAXRNG:_/ ____,	Range in tens of meters	0 to 9999

Default = applicable FCI data for weapon, model, and shell.

READY:_; OUTTIL:__/__/__;UREINF:_/_/_/__/___;DELETE:_┘

READY indicates unit status. An entry in this field indicates that the unit is ready. This is a conditional entry. Make no entry in this field if you make an entry in the OUTTIL field. Legal entry is an X.

4-16. AMMUNITION AND FIRE UNIT UPDATE INPUT MESSAGE (AFU;UPDATE) - CONTINUED

READY:_; **OUTTIL:__/__/__;** UREINF:_/_/_/__/___;DELETE:_↵

OUTTIL indicates that the unit status is "out" until the specified system time. This is a conditional entry. Make no entry in this field if you make an entry in the READY field. If you make an entry in any subfield, then all subfields must be present. Legal entries are:

OUTTIL:__/ __/__;	Day	1 to 31
OUTTIL:__/ **__/** __;	Hour	0 to 23
OUTTIL:__/__/ **__;**	Minute	0 to 59

READY:_;OUTTIL:__/__/__; **UREINF:_/_/_/__/___;** DELETE:_↵

UREINF indicates the unit being reinforced. This field is not used by BCS for processing. Legal entries are:

UREINF:_/ _/_/__/___;	Section	One alphabetic or numeric character
UREINF:_/ **_/** _/__/___;	Platoon	One alphabetic or numeric character
UREINF:_/_/ **_/** __/___;	Battery	One alphabetic or numeric character
UREINF:_/_/_/ **__/** ___;	Battalion	One or two alphabetic or numeric characters
UREINF:_/_/_/__/ **___;**	Regiment	One to three alphabetic or numeric characters

READY:_;OUTTIL:__/__/__;UREINF:_/_/_/__/___; **DELETE:_↵**

DELETE is the delete indicator. This field is not used by BCS for processing. Legal entry is an X.

4-16. AMMUNITION AND FIRE UNIT UPDATE INPUT MESSAGE (AFU;UPDATE) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;UPDATE;FU:_/_/_/__/___;WPN:_____;MODEL:_____;MSN:___;ZONE:_____;
CORD:_____/_____/_____;GZ:___;SPHERE:_;FULAT:___._;DTG:__/__/__;
APL:_/_/_;WSTR:__;AZ:____;ST:_;DF:____;PTEMP:____;RT:_;RS:_;TIMEØ:___;
MAXRTE:__._;SUSRTE:__._;MAXEL:____;TRAVLR:____/____;BPLOC:_/___/_/___;
MINRNG:____;MAXRNG:_/____,_/____,_/____,_/____,_/____;
READY:_;OUTTIL:__/__/__;UREINF:_/_/_/__/___;DELETE:_;
ORSTA:_____/_____/_____;ORSTAGZ:___;ORSTASPH:_;
ORSTB:_____/_____/_____;ORSTBGZ:___;ORSTBSPH:_;
```

ORSTA:_____/_____/_____; ORSTAGZ:___;ORSTASPH:_;

ORSTA indicates the orienting station coordinates for non-HIP weapon models. This data is used by the BCS as a reference point for the computation of howitzer locations if the BCS;PIECES message has an entry in the POLAR field and no entry in the FG field. If you make an entry in one subfield, you must make an entry in all subfields. This is a required entry.

For HIP, ORSTA indicates a howitzer specific location. Upon execution, BCS will enter it in the CORD field and remove it from the ORSTA field. An entry in ORSTA can be made to enter a specific howitzer location for transmission to TACFIRE. If you make an entry in one subfield, you must make an entry in all subfields. This is an optional entry. Legal entries are:

ORSTA:_____/ _____/_____;	Easting in meters	0 to 999999
ORSTA:_____/ **_____/** _____;	Northing in meters	0 to 11000000
ORSTA:_____/_____/ **_____;**	Altitude in meters	-9999 to +9999

ORSTA:_____/_____/_____; **ORSTAGZ:___;** ORSTASPH:_;

ORSTAGZ indicates the grid zone of the orienting station location for non-HIP weapons. For the HIP weapon, it is the howitzer entered in the ORSTA field. For the HIP weapon model, the entry in this field must match the entry in GZ of the SPRT;MAP message. This is an optional entry. Legal entries are -60 to +60 (excluding zero).

Default = map mod grid zone as specified in the SPRT;MAP message

---

4-16. AMMUNITION AND FIRE UNIT UPDATE INPUT MESSAGE (AFU;INPUT) - CONTINUED

ORSTA:_____/_____/_____;ORSTAGZ:___; **ORSTASPH:_;**

ORSTASPH indicates the spheroid code of the orienting station for non-HIP weapons. For the HIP weapon, it is the howitzer entered in the ORSTA field. This is an optional entry. Legal entries are 1 to 8.

Default = map mod spheroid as specified in the SPRT;MAP message

---

ORSTB:_____/_____/_____; ORSTBGZ:___;ORSTBSPH:_;

ORSTB indicates the orienting station B coordinates for non-HIP weapons. This data is used by the BCS as a reference point for the computation of howitzer locations if the BCS;PIECES message has an entry in the POLAR field and an entry of B in the FG field. If you make an entry in any subfield of ORSTB, then all subfields must be present. This is an optional entry. This field is not used for processing if the weapon is HIP. Legal entries are:

ORSTB:_____/ _____/_____;	Easting in meters	0 to 999999
ORSTB:_____/ **_____/** _____;	Northing in meters	0 to 11000000
ORSTB:_____/_____/ **_____;**	Altitude in meters	-9999 to +9999

ORSTB:_____/_____/_____; **ORSTBGZ:___;** ORSTBSPH:_;

ORSTBGZ indicates the grid zone of the orienting station B location for non-HIP weapons. This is an optional entry. This field is not used for processing if the weapon is HIP. Legal entries are -60 to +60 (excluding zero).

Default = map mod grid zone as specified in SPRT;MAP message if there is an entry present in ORSTB

4-16. AMMUNITION AND FIRE UNIT UPDATE INPUT MESSAGE (AFU;UPDATE) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;UPDATE;FU:_/_/_/__/___;WPN:_____;MODEL:_____;MSN:___;ZONE:_____;
CORD:_____/_______/_____;GZ:___;SPHERE:_;FULAT:___._;DTG:__/__/__;
APL:_/_/_;WSTR:__;AZ:____;ST:_;DF:____;PTEMP:____;RT:_;RS:_;TIMEØ:___;
MAXRTE:__._;SUSRTE:__._;MAXEL:____;TRAVLR:____/____;BPLOC:_/___/_/___;
MINRNG:_____;MAXRNG:_/____,_/____,_/____,_/____,_/____;
READY:_;OUTTIL:__/__/__;UREINF:_/_/_/__/___;DELETE:_
ORSTA:_____/_______/_____;ORSTAGZ:___;ORSTASPH:_;
ORSTB:_____/_______/_____;ORSTBGZ:___;ORSTBSPH:_;
```

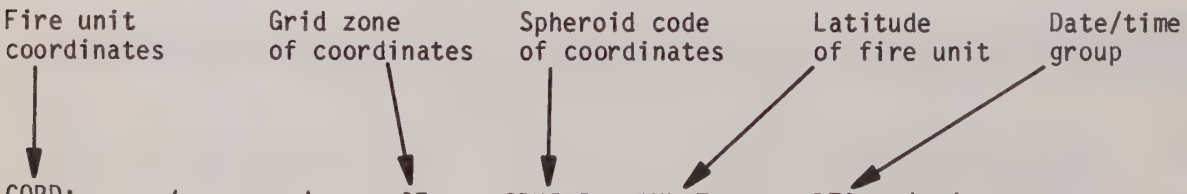
ORSTB:_____/_______/_____;ORSTBGZ:___; **ORSTBSPH:_;**

ORSTBSPH indicates the spheroid code of the orienting station B location for non-HIP weapons. This is an optional entry. This field is not used for processing if the weapon is HIP. Legal entries are 1 to 8.

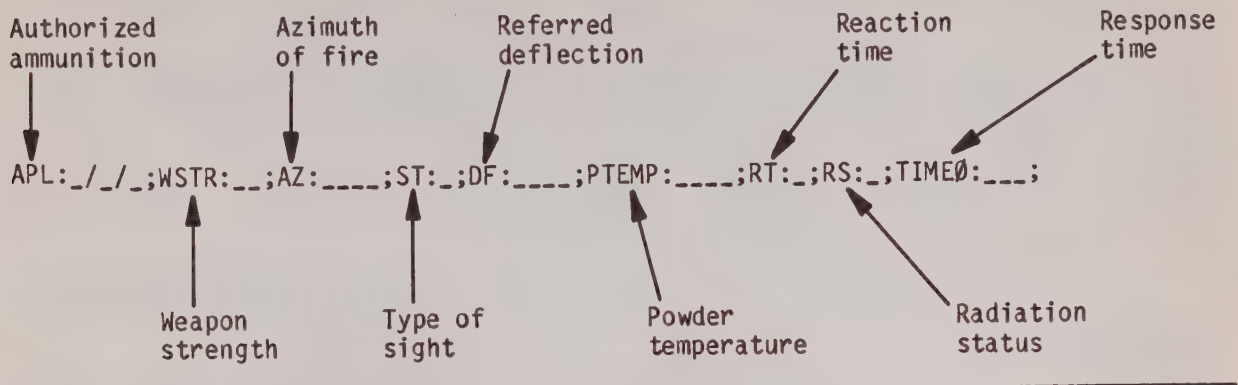
Default = map mod spheroid as specified in SPRT;MAP message if there is an entry present in ORSTB

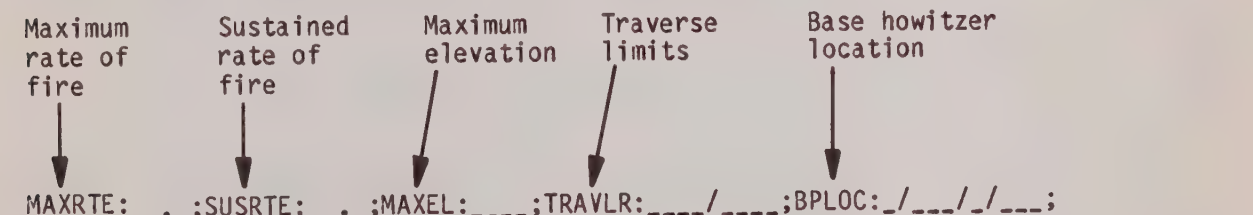
---

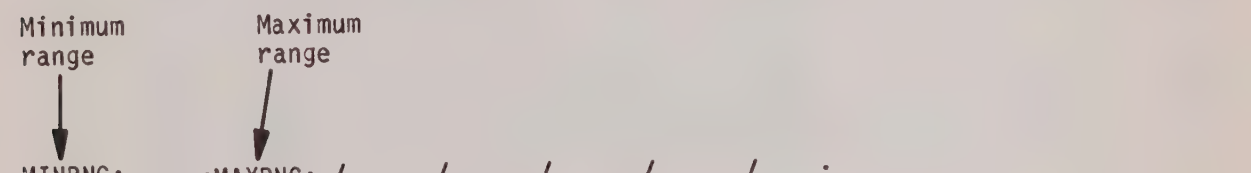
g. Exploded View. Use the following exploded view as a way to review the message.

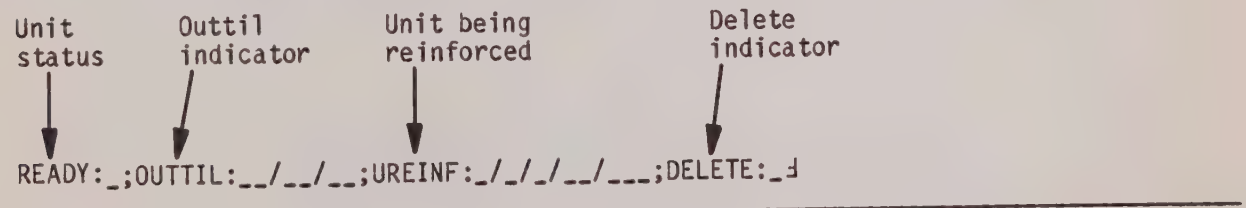


4-16. AMMUNITION AND FIRE UNIT UPDATE INPUT MESSAGE (AFU;UPDATE) - CONTINUED









4-16. AMMUNITION AND FIRE UNIT UPDATE INPUT MESSAGE (AFU;UPDATE) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;UPDATE;FU:_/_/_/__/___;WPN:_____;MODEL:_____;MSN:___;ZONE:_____;
CORD:_____/_____/_____;GZ:___;SPHERE:_;FULAT:___._;DTG:__/__/__;
APL:_/_/_;WSTR:__;AZ:____;ST:_;DF:____;PTEMP:____;RT:_;RS:_;TIMEØ:___;
MAXRTE:__._;SUSRTE:__._;MAXEL:____;TRAVLR:____/____;BPLOC:_/___/_/___;
MINRNG:____;MAXRNG:_/____,_/____,_/____,_/____,_/____;
READY:_;OUTTIL:__/__/__;UREINF:_/_/_/__/___;DELETE:_
ORSTA:_____/_____/_____;ORSTAGZ:___;ORSTASPH:_;
ORSTB:_____/_____/_____;ORSTBGZ:___;ORSTBSPH:_;
```

Orienting station or howitzer coordinates

Orienting station or howitzer grid zone

Orienting station or howitzer spheroid code

```
ORSTA:_____/_____/_____;ORSTAGZ:___;ORSTASPH:_;
```

Orienting station B coordinates (non-HIP)

Orienting station B grid zone (non-HIP)

Orienting station B spheroid code (non-HIP)

```
ORSTB:_____/_____/_____;ORSTBGZ:___;ORSTBSPH:_;
```

4-17. BCS PIECES MESSAGE (BCS;PIECES) (NON-HIP)

a. Purpose. The BCS;PIECES message is used to establish the locations, grouping, and status of the howitzers.

b. Source. The BCS;PIECES message is displayed upon execution of the AFU;UPDATE message. It can also be displayed by displaying the AFU;UPDATE message (refer to paragraph 4-16) and pressing the NEXT SEG key.

c. Input. You enter data concerning the howitzers. The BCS;PIECES message can store data for up to 12 howitzers.

d. Computer Processing. Pressing the EXEC key causes the fire unit file to be updated.

e. Output. The AFU;BAMOUP message is automatically displayed during the initialization sequence when a weapon model is selected.

f. Message Format and Legal Entries. The following BCS;PIECES message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
G01;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:____/____/_____;
G02;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:____/____/_____;
G03;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:____/____/_____;
G04;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:____/____/_____;
G05;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:____/____/_____;
G06;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:____/____/_____;
G07;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:____/____/_____;
G08;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:____/____/_____;
G09;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:____/____/_____;
G10;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:____/____/_____;
G11;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:____/____/_____;
G12;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:____/____/_____;
```

NOTE

Line G01 of the BCS;PIECES message is discussed on the following pages. The information given also applies to lines G02 through G12.

G01; OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:____/____/_____;

G01 through G12 indicates the howitzer number. It is automatically displayed by the computer.

4-17. BCS PIECES MESSAGE (BCS;PIECES) (NON-HIP) - CONTINUED

G01; **OK:_;** GRP:_;CORD:_____/_____/_____;FG:__;POLAR:____/____/_____;

OK indicates the howitzer status. This is an optional entry. Legal entries are:

Y - active howitzer with digital communication
D - delete howitzer from the data base
N - inactive howitzer
C - active howitzer with digital communication and Copperhead ammunition
V - active howitzer without digital communication (with voice)
W - active howitzer without digital communication (with voice) and Copperhead ammunition

Default = Y

G01;OK:_; **GRP:_;** CORD:_____/_____/_____;FG:__;POLAR:____/____/_____;

GRP indicates howitzer grouping. This is a conditional entry. You must make an entry in this field for each line that contains data. Legal entries are:

L - left platoon
C - center platoon
R - right platoon

G01;OK:_;GRP:_; **CORD:_____/_____/_____;** FG:__;POLAR:____/____/_____;

CORD indicates grid coordinates of the howitzer. This is a conditional entry. Make an entry in this field only when there is no entry in the POLAR field. Legal entries are:

CORD:_____/ _____/_____;	Easting in meters	0 to 999999
CORD:_____/ **_____/** _____;	Northing in meters	0 to 11000000
CORD:_____/_____/ **_____;**	*Altitude in meters	-9999 to +9999

* Default = altitude of the orienting station

4-17. BCS PIECES MESSAGE (BCS;PIECES) (NON-HIP) - CONTINUED

```
G01;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:___/___/_____;
G02;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:___/___/_____;
G03;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:___/___/_____;
G04;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:___/___/_____;
G05;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:___/___/_____;
G06;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:___/___/_____;
G07;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:___/___/_____;
G08;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:___/___/_____;
G09;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:___/___/_____;
G10;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:___/___/_____;
G11;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:___/___/_____;
G12;OK:_;GRP:_;CORD:_____/_______/_____;FG:__;POLAR:___/___/_____;
```

G01;OK:_;GRP:_;CORD:_____/_______/_____; **FG:__;** POLAR:___/___/_____;

FG indicates howitzer or orienting station used to locate other howitzers in the battery using polar coordinates. This is a conditional entry. If you make an entry in this field you must make an entry in the first and second subfields of POLAR. If FG is blank, then polar coordinates are referenced from ORSTA. When FG is present, the howitzer or orienting station specified must be present. Legal entries are 1 to 12 (howitzer number) or B (orienting station).

4-17. BCS PIECES MESSAGE (BCS;PIECES) (NON-HIP) - CONTINUED

GO1;OK:_;GRP:_;CORD:_____/_____/_____;FG__; **POLAR:____/____/_____;**

POLAR indicates the polar coordinates of a howitzer with respect to the UTM grid coordinates of ORSTA, ORSTB, or another howitzer. If a howitzer number of an established howitzer is entered in the FG field, the location of that howitzer is used to calculate the coordinates of the howitzer on that line. If B is entered in the FG field, the location of orienting station B (ORSTB) is used to calculate the coordinates of the howitzer on that line. When there is no entry in the FG field, the coordinates for that howitzer will be calculated in reference to the location of orienting station A (ORSTA). Upon execution and redisplaying of the BCS;PIECES message, the calculated UTM grid coordinates for the howitzer will be displayed in the CORD field. This is a conditional entry. Make no entry in this field if you made an entry in the CORD field. Legal entries are:

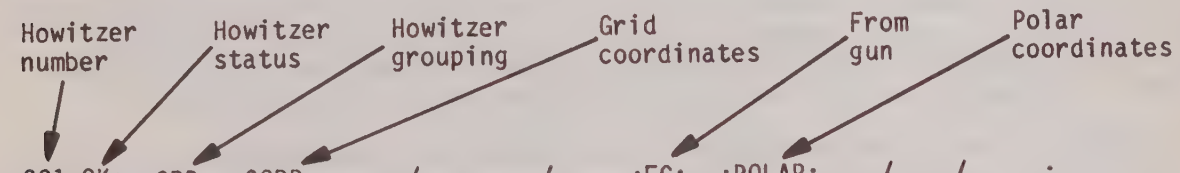
POLAR:___/ ____/_____;	Azimuth in mils	0 to 6399
POLAR:____/ **____/** _____;	Slant range in meters	0 to 9999
POLAR:____/____/ **_____;**	*Vertical angle	0 to ±1599

*Default = 0

4-17. BCS PIECES MESSAGE (BCS;PIECES) (NON-HIP) - CONTINUED

```
G01;OK:_;GRP:_;CORD:______/________/_____;FG:__;POLAR:____/____/_____;
G02;OK:_;GRP:_;CORD:______/________/_____;FG:__;POLAR:____/____/_____;
G03;OK:_;GRP:_;CORD:______/________/_____;FG:__;POLAR:____/____/_____;
G04;OK:_;GRP:_;CORD:______/________/_____;FG:__;POLAR:____/____/_____;
G05;OK:_;GRP:_;CORD:______/________/_____;FG:__;POLAR:____/____/_____;
G06;OK:_;GRP:_;CORD:______/________/_____;FG:__;POLAR:____/____/_____;
G07;OK:_;GRP:_;CORD:______/________/_____;FG:__;POLAR:____/____/_____;
G08;OK:_;GRP:_;CORD:______/________/_____;FG:__;POLAR:____/____/_____;
G09;OK:_;GRP:_;CORD:______/________/_____;FG:__;POLAR:____/____/_____;
G10;OK:_;GRP:_;CORD:______/________/_____;FG:__;POLAR:____/____/_____;
G11;OK:_;GRP:_;CORD:______/________/_____;FG:__;POLAR:____/____/_____;
G12;OK:_;GRP:_;CORD:______/________/_____;FG:__;POLAR:____/____/_____;
```

g. Exploded View. Use the following exploded view as a way to review the message.



4-18. FIRE UNIT AMMUNITION UPDATE MESSAGE (AFU;BAMOUP)

a. Purpose. For a non-HIP weapon model, the AFU;BAMOUP message is used for operator review and to enter or update the status of ammunition available at the fire units. For the HIP weapon model, the AFU;BAMOUP message is non-executable and is used for operator review and to transmit the status of ammunition available at the fire units to TACFIRE.

b. Source. During the initialization sequence when a non-HIP weapon model is selected, the AFU;BAMOUP is automatically displayed when the BCS;PIECES message is executed. The AFU;BAMOUP message can be displayed from the following summary messages:

- SYS;MSGSUM
- SYS;IQSUM
- BCS;DBSUM.

If more than one segment is needed to enter all ammunition data for non-HIP weapons and a blank segment is not automaticaly displayed, use the following procedure to access a blank segment. After you have executed an AFU;BAMOUP message, redisplay the message and press the NEXT SEG key until a blank segment is displayed.

c. Input. For a non-HIP weapon, you enter data concerning ammunition available at the fire unit. Each segment of the message can be used to process data for six projectiles, three powders, and six fuzes. The data base can store data for up to 26 projectiles, 9 powders, and 26 fuzes. To process all the ammunition data which the data base can store, you must use five segments of the message. For the HIP weapon, the AFU;BAMOUP message is updated through data entered in the HOW;AMOUP message.

d. Computer Processing. For a non-HIP weapon, pressing the EXEC key causes the data in the AFU;BAMOUP message to be stored in the fire unit file. Pressing the XMIT key transmits the data in the AFU;BAMOUP message to any subscriber except a howitzer. The AFU;BAMOUP for the HIP weapon cannot be executed.

e. Output. The number of shells, powders, and fuzes displayed on the BCS;DBSUM message is updated. During the initialization sequence for a non-HIP weapon, another segment of the AFU;BAMOUP is displayed if the file is not full.

f. Message Format and Legal Entries. The following AFU;BAMOUP message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;BAMOUP;FU:_/_/_/__/___;AMOR:_;AMOE:_;AMOH:_;DTG:__/__/__;
PROJA:___/_/___._/____,___/_/___._/____,___/_/___._/____;
PROJB:___/_/___._/____,___/_/___._/____,___/_/___._/____;
PLOT:_____/_/____,_____/_/____,_____/_/____;
FZES:____/____,____/____,____/____,____/____,____/____,____/____;
MMQ:____/___/__,____/___/__,____/___/__,____/___/__
```

4-18. FIRE UNIT AMMUNITION UPDATE MESSAGE (AFU;BAMOUP) - CONTINUED

AFU;BAMOUP; FU:_/_/_/__/___;AMOR:_;AMOE:_;AMOH:_;DTG:__/__/__;

AFU;BAMOUP identifies the message as the fire unit ammunition update message.

AFU;BAMOUP; **FU:_/_/_/__/___;** AMOR:_;AMOE:_;AMOH:_;DTG:__/__/__;

FU indicates the fire unit name. This is a computer generated entry. If you display the AFU;BAMOUP message from the data base, this field will be automatically entered with the fire unit name you entered in the SYS;COMM message. You may change this data if you wish. Legal entries and values displayed are:

FU:_/ _/_/__/___;	Section	One alphabetic or numeric character
FU:_/ **_/** _/__/___;	Platoon	One alphabetic or numeric character
FU:_/_/ **_/** __/___;	Battery	One alphabetic or numeric character
FU:_/_/_/ **__/** ___;	Battalion	One or two alphabetic or numeric characters
FU:_/_/_/__/ **___;**	Regiment	One to three alphabetic or numeric characters

---

AFU;BAMOUP;FU:_/_/_/__/___; **AMOR:_;** AMOE:_;AMOH:_;DTG:__/__/__;

AMOR indicates ammunition received. An entry in this field specifies that the ammunition entered has been received and adds the ammunition data entered in the AFU;BAMOUP message to the ammunition data stored in the data base. This is a conditional entry. Make no entry in this field if there is an entry in the AMOE or AMOH fields. Legal entry is an X.

AFU;BAMOUP;FU:_/_/_/__/___;AMOR:_; **AMOE:_;** AMOH:_;DTG:__/__/__;

AMOE indicates ammunition expended. An entry in this field specifies that the ammunition entered has been expended and subtracts the ammunition data entered in the AFU;BAMOUP message from the ammunition data stored in the data base. This is a conditional entry. Make no entry in this field if there is an entry in the AMOR or AMOH fields. Legal entry is an X.

4-18. FIRE UNIT AMMUNITION UPDATE MESSAGE (AFU;BAMOUP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;BAMOUP;FU:_/_/_/__/___;AMOR:_;AMOE:_;AMOH:_;DTG:__/__/__;
PROJA:___/_/___._/____,___/_/___._/____,___/_/___._/____;
PROJB:___/_/___._/____,___/_/___._/____,___/_/___._/____;
PLOT:_____/_/____,_____/_/____,_____/_/____;
FZES:____/____,____/____,____/____,____/____,____/____,____/____;
MMQ:____/__/__,____/__/__,____/__/__,____/__/__
```

AFU;BAMOUP;FU:_/_/_/__/___;AMOR:_;AMOE:_; **AMOH:_;** DTG:__/__/__;

AMOH indicates ammunition on hand. This field specifies that the ammunition specified is on hand for projectile, propellant, and fuze. If you display the AFU;BAMOUP message from the data base, this field will be entered automatically. This is a conditional entry. Make no entry in this field if there is an entry in the AMOR or AMOE fields. Legal entry is an X.

AFU;BAMOUP;FU:_/_/_/__/___;AMOR:_;AMOE:_;AMOH:_; **DTG:__/__/__;**

DTG indicates the date/time group. This is an optional entry. Legal entries are:

DTG:__/ __/__;	Day	1 to 31
DTG:__/ **__/** __;	Hour	0 to 23
DTG:__/__/ **__;**	Minute	0 to 59

Default = system date and time

NOTE

The PROJA line of the AFU;BAMOUP message is described on the following page. The information given also applies to the PROJB line.

4-18. FIRE UNIT AMMUNITION UPDATE MESSAGE (AFU;BAMOUP) - CONTINUED

PROJA:___/_/___._/____,___/_/___._/____,___/_/___._/____;

PROJA indicates projectile characteristics. The PROJA and PROJB lines each have three iterations of data subfields. Each segment of the message will hold data for up to six projectiles. The data base will hold data for up to 26 projectiles. This is an optional entry. If you make an entry in any iteration, you must make an entry in the first, second, and fourth subfields for that iteration. If you enter a square weight, there must be values before and after the decimal point. (For example, 0.5 or 7.0.) Legal entries are listed below. (For more information, refer to appendix G.)

PROJA:___/ _/___._/____,	Shell category	Three alphabetic characters
PROJA:___/ **_/** ___._/____,	Lot designator	One alphabetic character
PROJA:___/_/ **___._/** ____,	*Weight in pounds or squares (if entered in squares, it will be stored in pounds)	10.1 to 999.9 (if squares, 0.5 to 10.0)
PROJA:___/_/___._/ **____,**	Quantity	0 to 9999

*Default = shell weight specified in appendix M

PLOT:_____/_/____,_____/_/____,_____/_/____;

PLOT indicates propellant characteristics. Each segment of the message can hold data for up to three propellants. The data base will hold data for up to nine propellants. This is an optional entry. If you make an entry in any iteration of PLOT, you must make an entry in all subfields for that iteration. (If 105mm weapons or the 14.5mm trainer are being used, the BCS does not use PLOT. The system will accept any entries you make. However, the entries will not be stored.) Legal entries are listed below. (For more information, refer to appendix G.)

PLOT:_____/ _/____,	Model number	One to six alphanumeric characters
PLOT:_____/ **_/** ____,	Lot	One alphabetic character
PLOT:_____/_/ **____,**	Quantity	0 to 9999

4-18. FIRE UNIT AMMUNITION UPDATE MESSAGE (AFU;BAMOUP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;BAMOUP;FU:_/_/_/__/___;AMOR:_;AMOE:_;AMOH:_;DTG:__/__/__;
PROJA:___/_/___._/____,___/_/___._/____,___/_/___._/____;
PROJB:___/_/___._/____,___/_/___._/____,___/_/___._/____;
PLOT:_____/_/____,_____/_/____,_____/_/____;
FZES:___/____,___/____,___/____,___/____,___/____,___/____,___/____;
MMQ:___/__/__,___/__/__,___/__/__,___/__/__,
```

```
FZES:___/____,___/____,___/____,___/____,___/____,___/____;
```

FZES indicates fuze characteristics. Each segment of the message can hold up to six sets of fuze data. The data base will hold data for up to 26 sets of fuze data. This is an optional entry. If you make an entry in any iteration, you must make an entry in both subfields for that iteration. Legal entries are listed below. (For more information, refer to appendix G.)

`FZES:___/` `____,`	Category	One to four alphanumeric characters
`FZES:___/` `____,`	Quantity	0 to 9999

```
MMQ:___/__/__,___/__/__,___/__/__,___/__/__,
```

MMQ indicates mark/model/quantity. An entry is required at TACFIRE prior to processing a nuclear mission. It is for information only. It is not used by BCS for processing. The entry in the first subfield is based on the weapon caliber loaded.

`MMQ:___/` `__/__,`	Mark	MK48, MK33, MK79
`MMQ:___/` `__/` `__,`	Model	1Y1, 1Y2, 1Y3, 0Y1, 0Y2, 0Y3, 0Y4
`MMQ:___/__/` `__,`	Quantity	0 to 99

4-18. FIRE UNIT AMMUNITION UPDATE MESSAGE (AFU;BAMOUP) - CONTINUED

g. Exploded View. Use the following exploded view as a way to review the message.

Message ID | Fire unit name | Ammunition received | Ammunition expended | Ammunition on hand | Date/time group

```
AFU;BAMOUP;FU:_/_/_/__/___;AMOR:_;AMOE:_;AMOH:_;DTG:__/__/__;
```

Projectile Characteristics

Type | Lot | Weight | Quantity

```
PROJA:___/_/___._/____,___/_/___._/____,___/_/___._/____;
PROJB:___/_/___._/____,___/_/___._/____,___/_/___._/____;
```

Propellant Characteristics

Type | Lot | Quantity

```
PLOT:______/_/____,______/_/____,______/_/____;
```

Fuze Characteristics

Category | Quantity

```
FZES:____/____,____/____,____/____,____/____,____/____,____/____;
```

4-18. FIRE UNIT AMMUNITION UPDATE MESSAGE (AFU;BAMOUP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;BAMOUP;FU:_/_/_/__/___;AMOR:_;AMOE:_;AMOH:_;DTG:__/__/__;
PROJA:___/_/___._/____,___/_/___._/____,___/_/___._/____;
PROJB:___/_/___._/____,___/_/___._/____,___/_/___._/____;
PLOT:_____/_/____,_____/_/____,_____/_/____;
FZES:____/____,____/____,____/____,____/____,____/____,____/____;
MMQ:____/___/__,____/___/__,____/___/__,____/___/__
```

Mark/model/quantity

```
MMQ:____/___/__,____/___/__,____/___/__,____/___/__
```

CHAPTER 5

INDEXES AND SUMMARIES

OVERVIEW

This chapter contains information about the SYS;INDEX message.

Section I provides a general description of the SYS;INDEX message and the options that can be selected from it.

Section II provides flowcharts that show you how to use the SYS;INDEX message.

Section III provides specific information about message formats. Message formats are shown as they appear on the lower display of the BCU. An explanation of the mnemonics used and the legal data entries is also provided.

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Section I. GENERAL INFORMATION

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5-1. SYSTEM INDEX

The SYS;INDEX message is the "master menu" for the system. It is used to access all the other summary and index messages for the system except the SYS;WEAPONS message (paragraph 4-9). Figure 5-1 on pages 5-4 and 5-5 shows you the indexes and summaries which can be accessed through the SYS;INDEX message for a non-HIP weapon. Figure 5-2 on pages 5-6 and 5-7 shows you the indexes and summaries which can be accessed through the SYS;INDEX message for the HIP weapon. These figures also show you the areas of data which can be accessed through those indexes and summaries. Entering an index number (1-7) into the SELECT field of the SYS;INDEX message allows you to access one of seven functions. These functions are:

- processing input queue information
- processing message skeletons
- processing data base information
- processing fire plan information
- processing system setup and subscriber data (initialization messages)
- displaying system warning data
- processing a fire plan group entry.

5-2. INPUT QUEUE

Selecting INPUT QUEUE from the SYS;INDEX message displays the SYS;IQSUM message. This message tells you what messages are stored in the input queue. It also gives you other data such as subscriber, status, priority, and date of receipt of the message. Individual messages may be reviewed by selecting that message from the SYS;IQSUM message.

5-3. MESSAGE SKELETONS

Selecting MESSAGE SKELETONS from the SYS;INDEX message provides a list of the different message skeletons (blank message formats) that are available for your use. This information is presented in the SYS;MSGSUM message. You enter data into the message skeleton and complete the processing by pressing the EXEC key. The message skeletons will be used most often when you receive voice or written information that must be entered manually into the computer using the keyboard. The individual messages are explained in chapters 4, 6, 7, 9, and 10.

5-4. DATA BASE

Selecting DATA BASE displays the BCS;DBSUM message. You may choose any of the 11 areas of data for a non-HIP weapon and 14 areas of data for the HIP weapon stored in the data base. Making a selection will display the data you need in a particular type of message format. The data areas from which you may choose and the message formats used for each when a non-HIP weapon is loaded are:

5-4. DATA BASE - CONTINUED

- map mod data (SPRT;MAP)
- AFU update/howitzer data (AFU;UPDATE/BCS;PIECES)
- ammunition data (AFU;BAMOUP)
- mask data (BCS;MSKSUM)
- meteorological data (MET;CM)
- observer data (BCS;OBSUM)
- target/known point data (BCS;TKPSUM)
- geometry data (BCS;GEOSUM)
- muzzle velocity variation data (BCS;MVVSUM)
- registration data (BCS;REGSUM).

The data areas from which you may choose and the message formats used for each when the HIP weapon is loaded are:

- map mod data (SPRT;MAP)
- howitzer subscriber data (BCS;HSBSUM)
- platoon update data (AFU;UPDATE)
- howitzer update data (BCS;HOWSUM)
- platoon ammunition data (AFU;BAMOUP)
- howitzer ammunition data (BCS;HAMSUM)
- mask data (BCS;MSKSUM)
- meteorological data (MET;CM)
- observer data (BCS;OBSUM)
- target/known point data (BCS;TKPSUM)
- geometry data (BCS;GEOSUM)
- muzzle velocity variation data (BCS;MVVSUM)
- registration data (BCS;REGSUM).

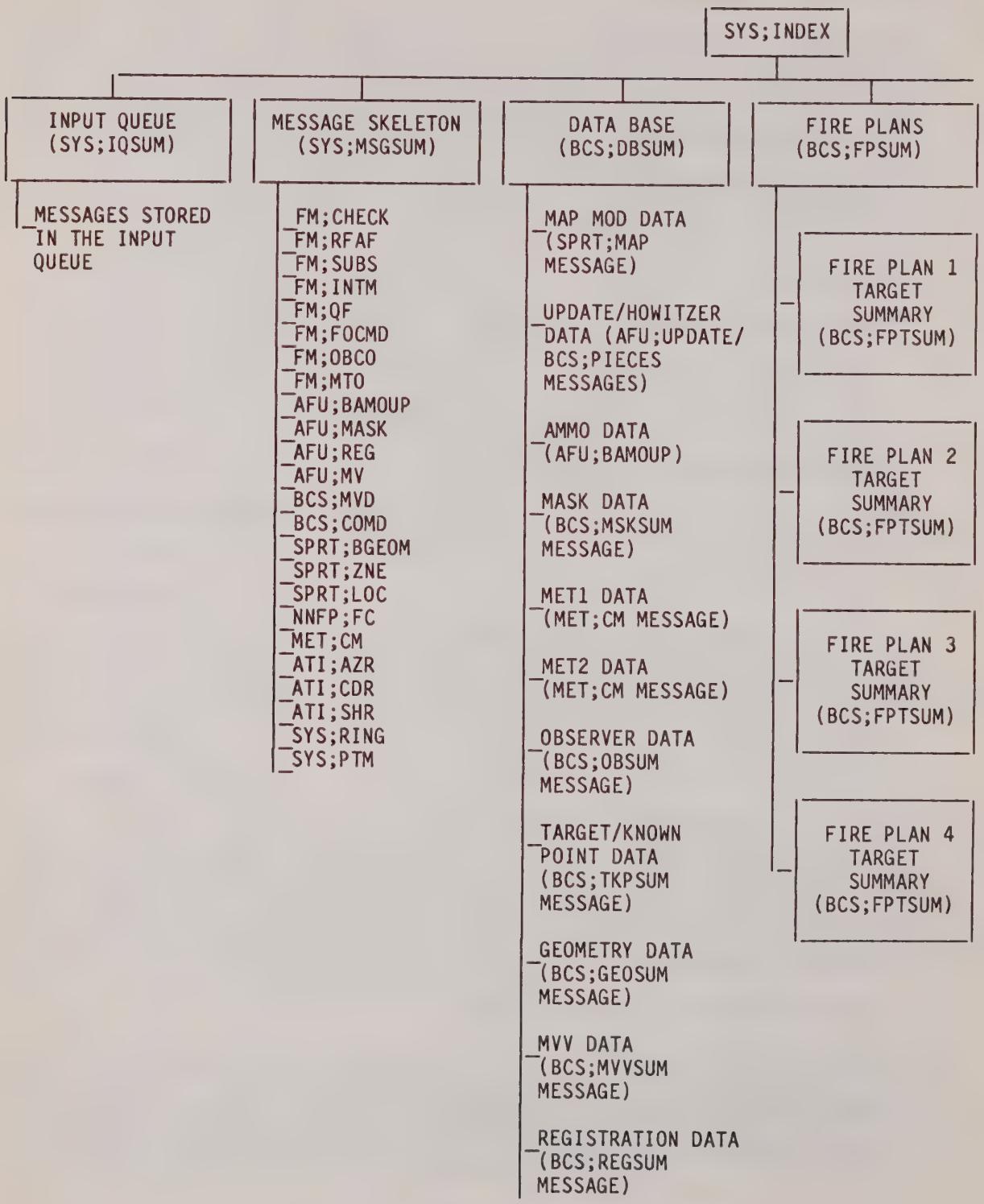

Figure 5-1. SYS;INDEX and Subindexes (Non-HIP)

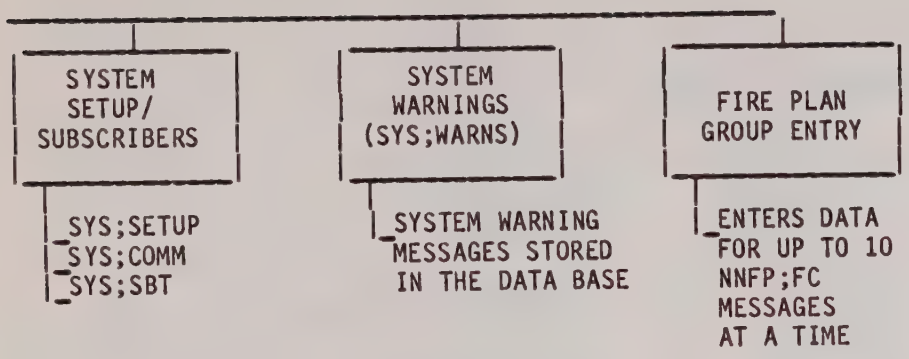
SYSTEM SETUP/ SUBSCRIBERS
SYS;SETUP
SYS;COMM
SYS;SBT
SYSTEM WARNINGS (SYS;WARNS)
SYSTEM WARNING MESSAGES STORED IN THE DATA BASE
FIRE PLAN GROUP ENTRY
ENTERS DATA FOR UP TO 10 NNFP;FC MESSAGES AT A TIME

Figure 5-1. SYS;INDEX and Subindexes (Non-HIP) - Continued

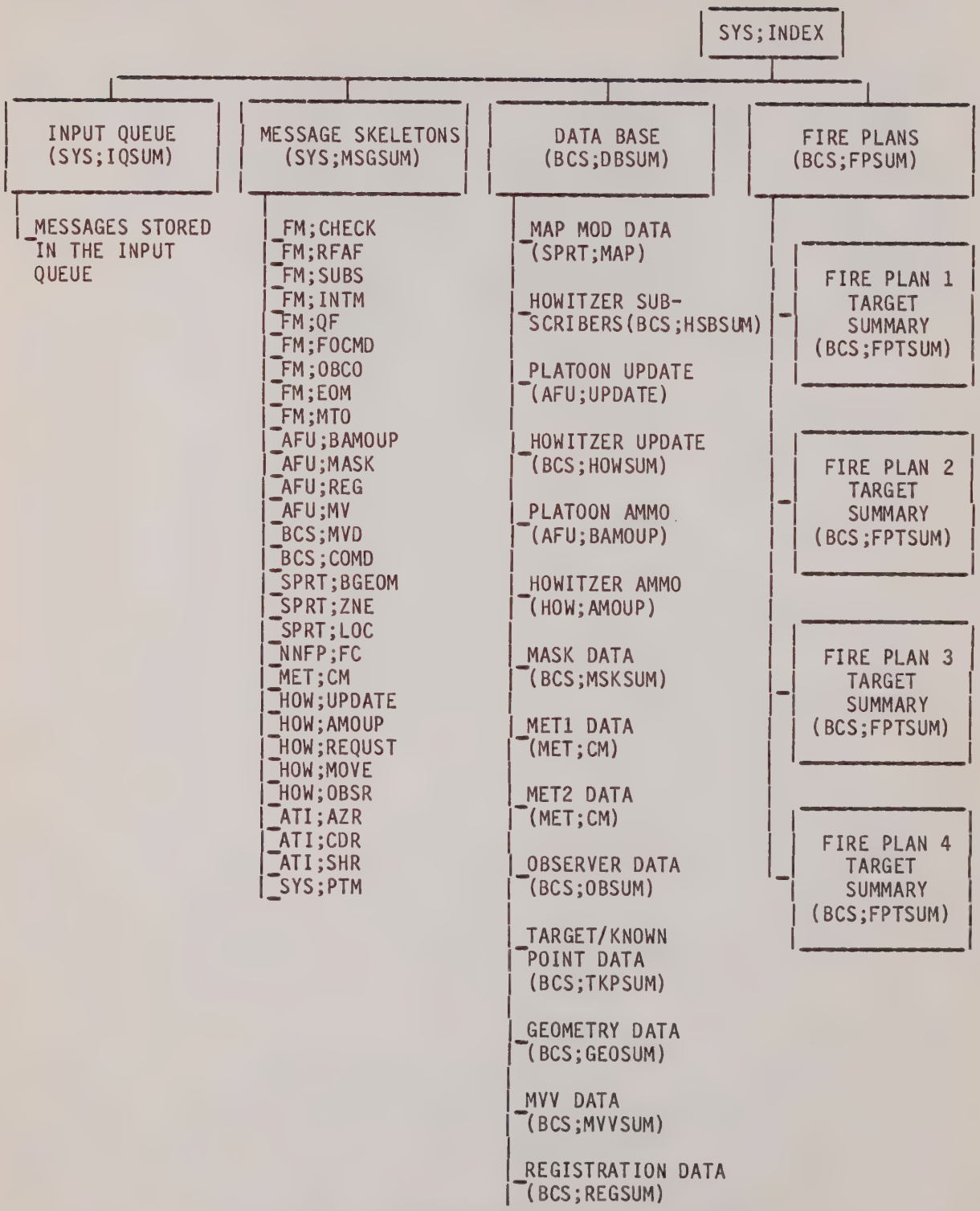

Figure 5-2. SYS;INDEX and Subindexes (HIP)

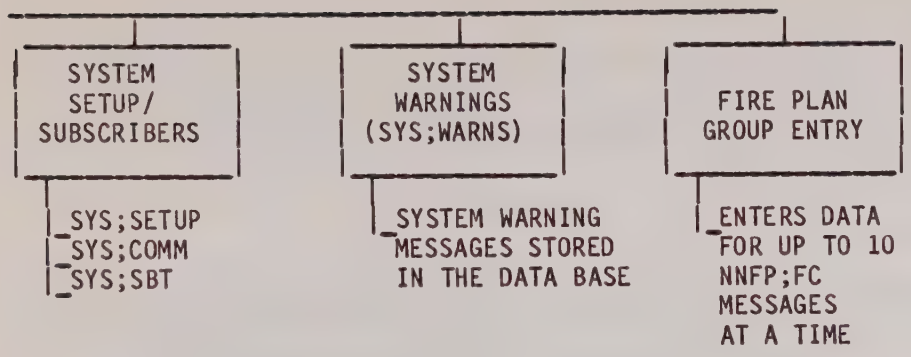
SYSTEM SETUP/ SUBSCRIBERS
SYS;SETUP
SYS;COMM
SYS;SBT
SYSTEM WARNINGS (SYS;WARNS)
SYSTEM WARNING MESSAGES STORED IN THE DATA BASE
FIRE PLAN GROUP ENTRY
ENTERS DATA FOR UP TO 10 NNFP;FC MESSAGES AT A TIME

Figure 5-2. SYS;INDEX and Subindexes (HIP) - Continued

5-5. FIRE PLANS

Selecting FIRE PLANS from the SYS;INDEX message allows you to review a summary of the fire plans stored in the data base. This information is presented in the BCS;FPSUM message. Fire plan data concerning an individual fire plan may be reviewed by selecting that fire plan from the BCS;FPSUM message. Refer to chapter 9 for a discussion of fire plan processing.

5-6. SYSTEM SETUP/SUBSCRIBERS

Selecting SYSTEM SETUP/SUBSCRIBERS from the SYS;INDEX message displays the SYS;SETUP message. Through the SYS;SETUP message you can access the SYS;COMM and SYS;SBT messages. These messages allow you to change setup data and to record the data base. For example, if you have a change in your subscriber net, then you will make a change to the SYS;SBT message. If your system status changes, you will make a change to the SYS;COMM message. If a non-HIP weapon is loaded and you want to change the method used to poll howitzers, you will make a change to the SYS;SETUP message. The data base and setup data should be recorded at specific time intervals in accordance with your SOP. This will be done to avoid a complete loss of data if you have a power loss and your PDU batteries do not supply power. It is also normal to record the data base and setup data just prior to scheduled shutdowns. The procedures used to update the setup data are provided in paragraph 6-25. Specific procedures used to record the data base and setup data are discussed in chapter 6.

5-7. SYSTEM WARNINGS

Selecting SYSTEM WARNINGS from the SYS;INDEX message allows you to review up to 12 system warning messages currently stored in the system. This information is presented in the SYS;WARNS message. (Refer to paragraph 5-41.)

5-8. FIRE PLAN GROUP ENTRY

Selecting FIRE PLAN GROUP ENTRY from the SYS;INDEX message allows you to cause a one-step transfer of up to 10 NNFP;FC fire plan messages at a time from the input queue to the fire plan file in the order they were received. (Refer to chapter 9 for a discussion of fire plan processing.)

Section II. INDEX AND SUMMARY FLOWCHARTS

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DISPLAYING A MESSAGE SKELETON FROM THE SYS;MSGSUM MESSAGE	5-11	5-12
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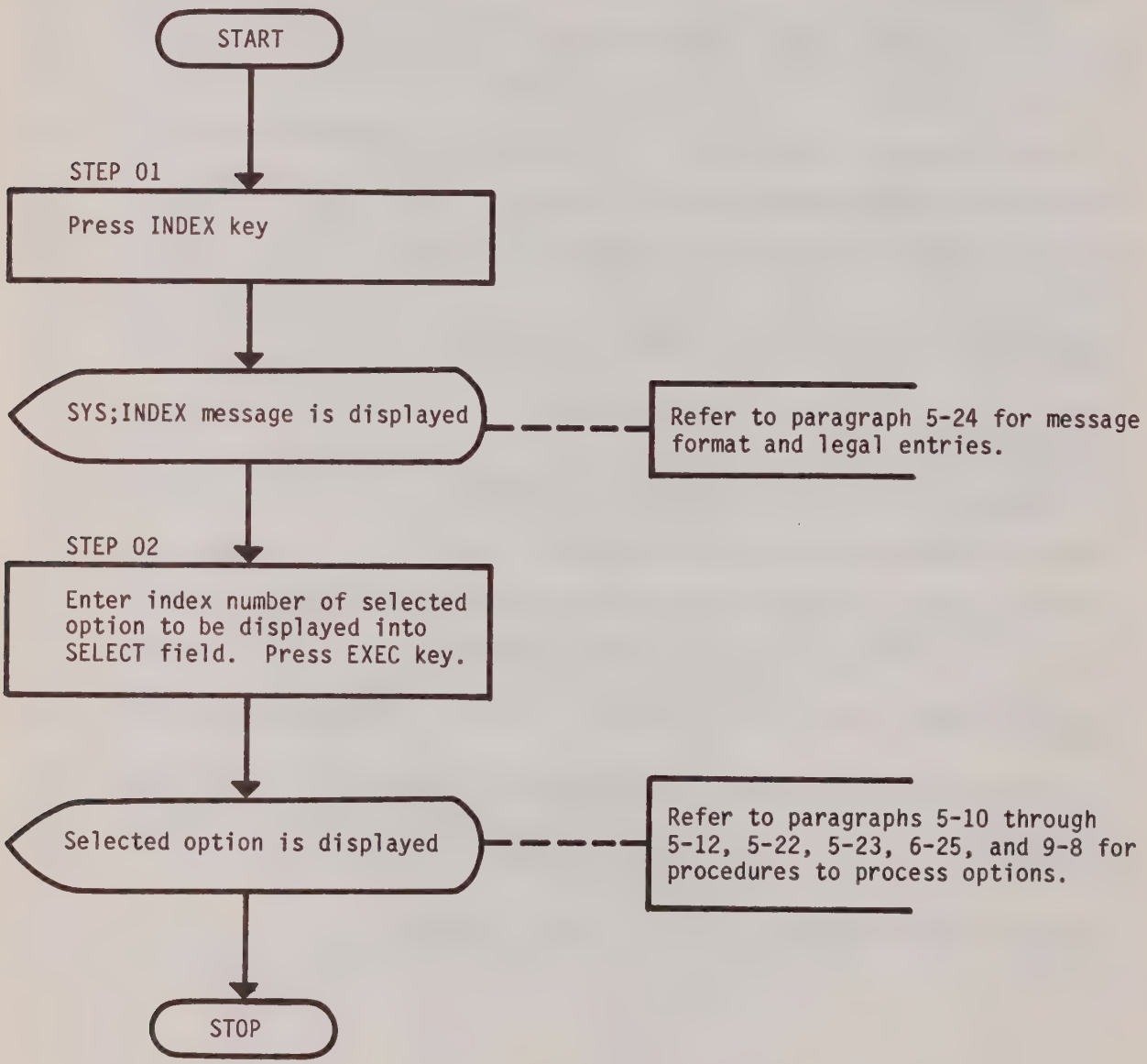
DISPLAYING REGISTRATION DATA FROM THE BCS;REGSUM MESSAGE	5-21	5-22
DISPLAYING FIRE PLAN DATA FROM THE BCS;FPSUM MESSAGE AND FIRE PLAN TARGET DATA FROM THE BCS;FPTSUM MESSAGE	5-22	5-23
DISPLAYING SYSTEM WARNINGS FROM THE SYS;WARNS MESSAGE	5-23	5-25

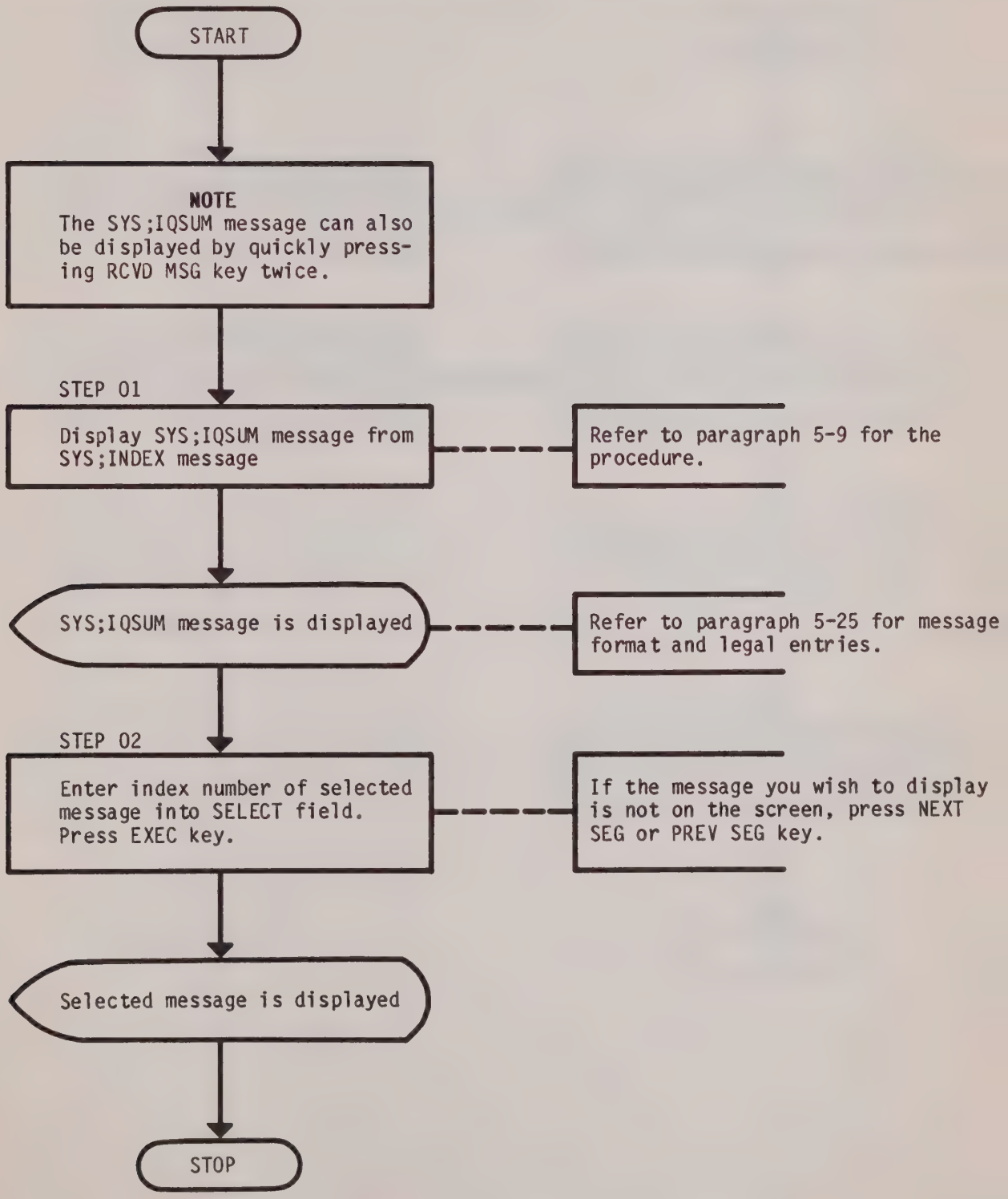
5-9. USING THE SYS;INDEX MESSAGE TO SELECT OPTIONS

Use this flowchart to select an option from the SYS;INDEX message.


START
STEP 01
Press INDEX key
SYS;INDEX message is displayed
Refer to paragraph 5-24 for message format and legal entries.
STEP 02
Enter index number of selected option to be displayed into SELECT field. Press EXEC key.
Selected option is displayed
Refer to paragraphs 5-10 through 5-12, 5-22, 5-23, 6-25, and 9-8 for procedures to process options.
STOP

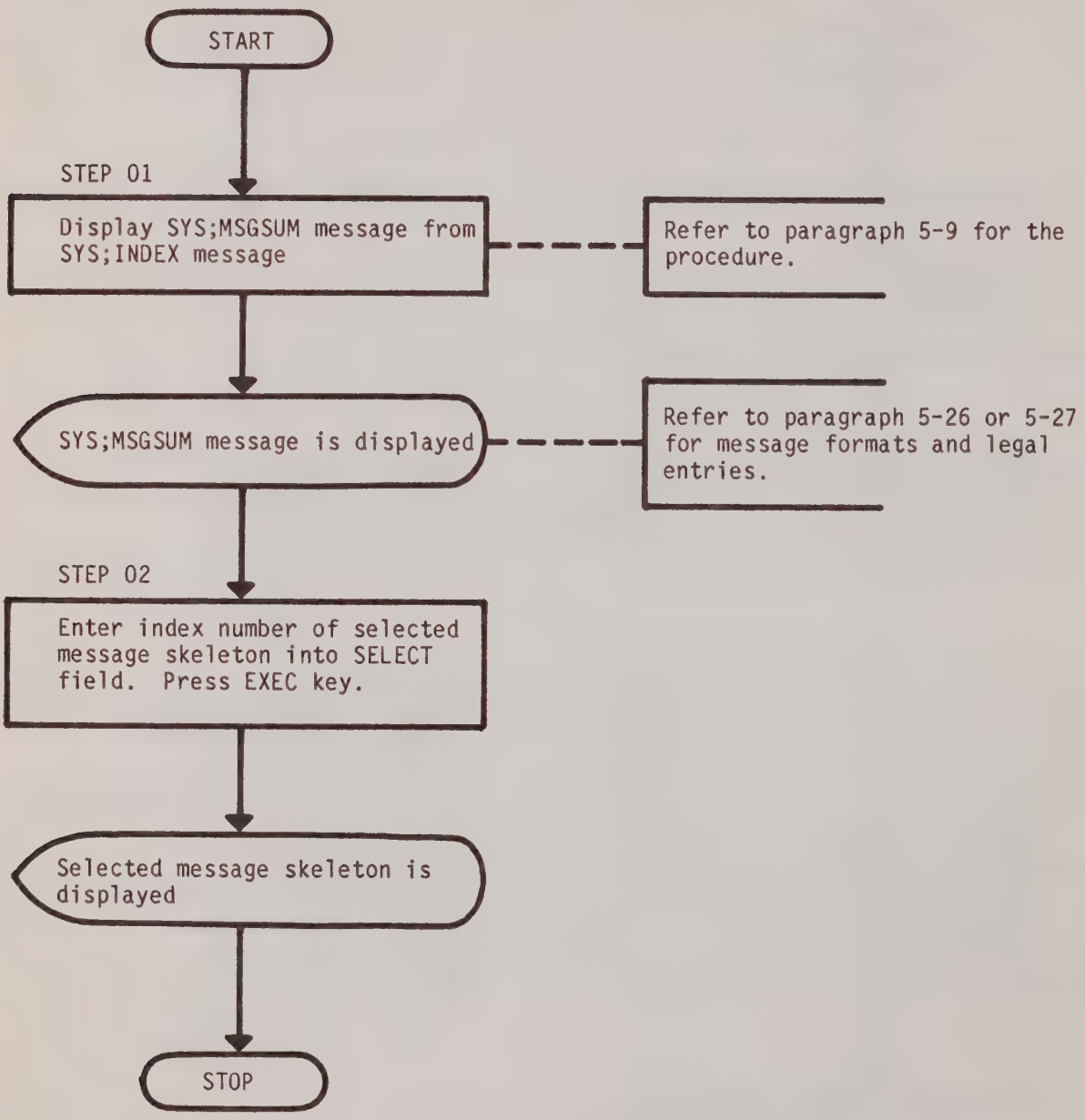
5-10. DISPLAYING A MESSAGE FROM THE SYS;IQSUM MESSAGE

Use this flowchart to display a message from the SYS;IQSUM message.


START
NOTE
The SYS;IQSUM message can also be displayed by quickly pressing RCVD MSG key twice.
STEP 01
Display SYS;IQSUM message from SYS;INDEX message
Refer to paragraph 5-9 for the procedure.
SYS;IQSUM message is displayed
Refer to paragraph 5-25 for message format and legal entries.
STEP 02
Enter index number of selected message into SELECT field. Press EXEC key.
If the message you wish to display is not on the screen, press NEXT SEG or PREV SEG key.
Selected message is displayed
STOP

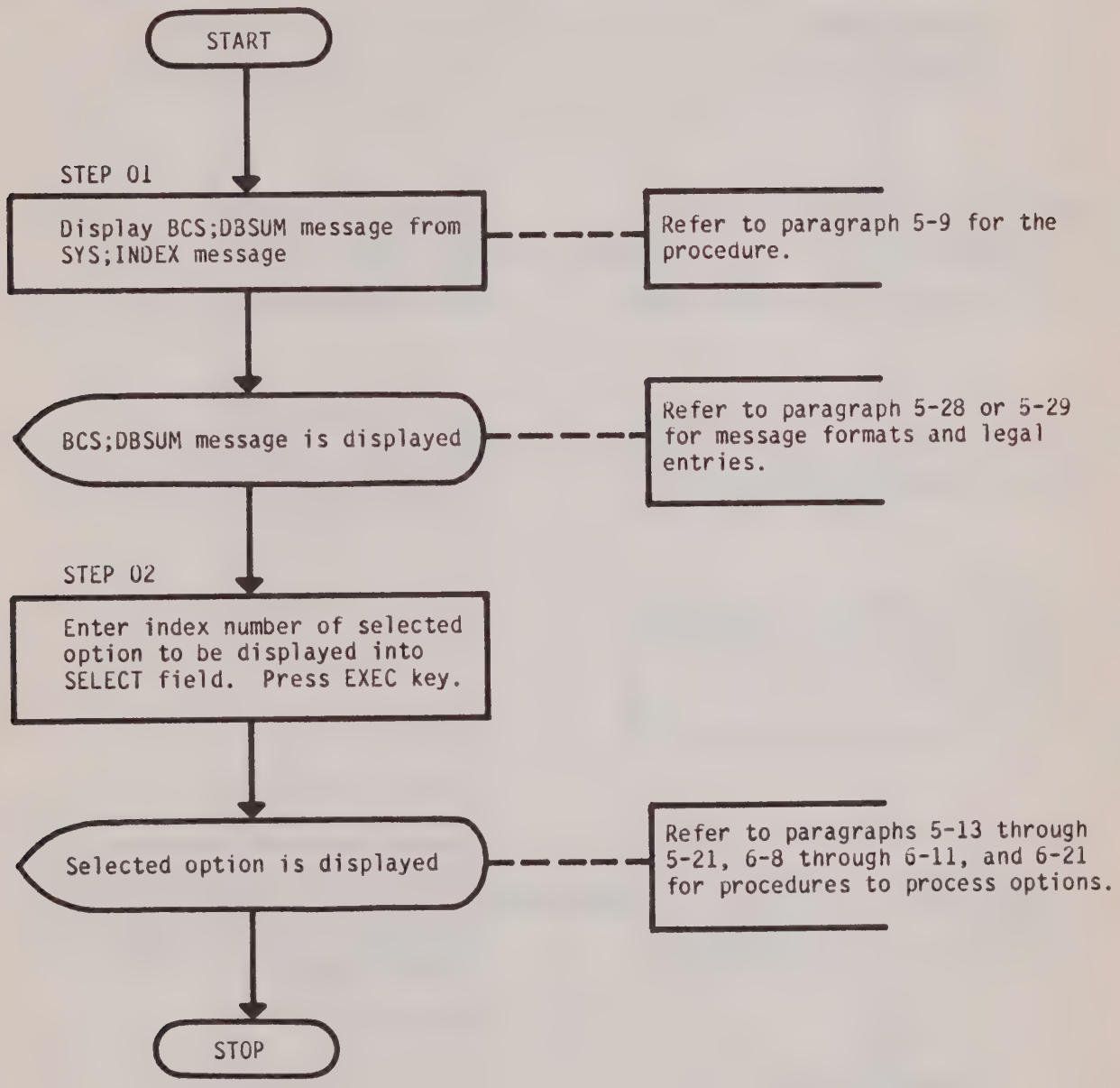
5-11. DISPLAYING A MESSAGE SKELETON FROM THE SYS;MSGSUM MESSAGE

Use this flowchart to display a message skeleton from the SYS;MSGSUM message.


START
STEP 01
Display SYS;MSGSUM message from SYS;INDEX message
Refer to paragraph 5-9 for the procedure.
SYS;MSGSUM message is displayed
Refer to paragraph 5-26 or 5-27 for message formats and legal entries.
STEP 02
Enter index number of selected message skeleton into SELECT field. Press EXEC key.
Selected message skeleton is displayed
STOP

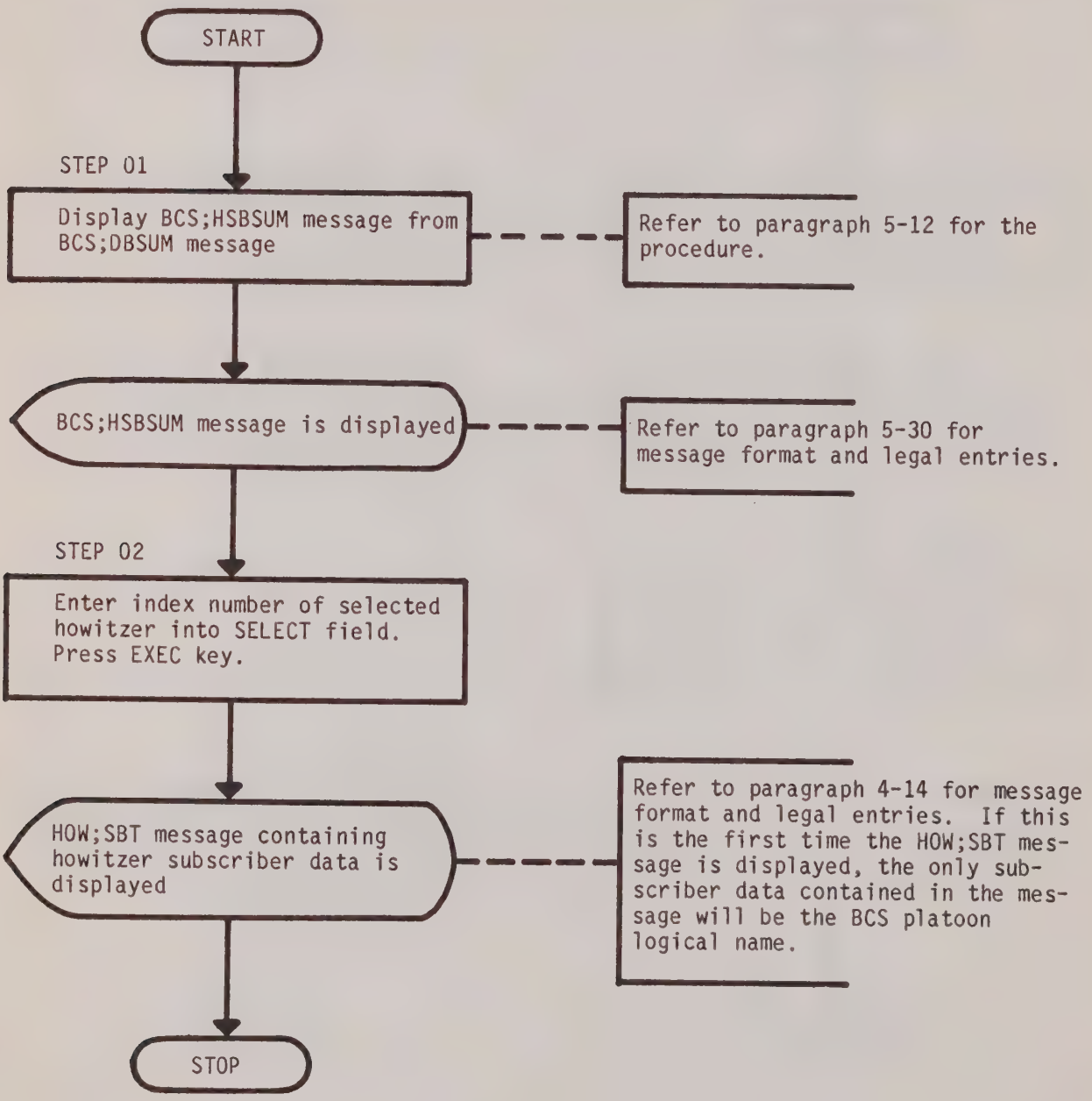
5-12. USING THE BCS;DBSUM MESSAGE TO SELECT OPTIONS

Use this flowchart to select options from the BCS;DBSUM message.


START
STEP 01
Display BCS;DBSUM message from SYS;INDEX message
Refer to paragraph 5-9 for the procedure.
BCS;DBSUM message is displayed
Refer to paragraph 5-28 or 5-29 for message formats and legal entries.
STEP 02
Enter index number of selected option to be displayed into SELECT field. Press EXEC key.
Selected option is displayed
Refer to paragraphs 5-13 through 5-21, 6-8 through 6-11, and 6-21 for procedures to process options.
STOP

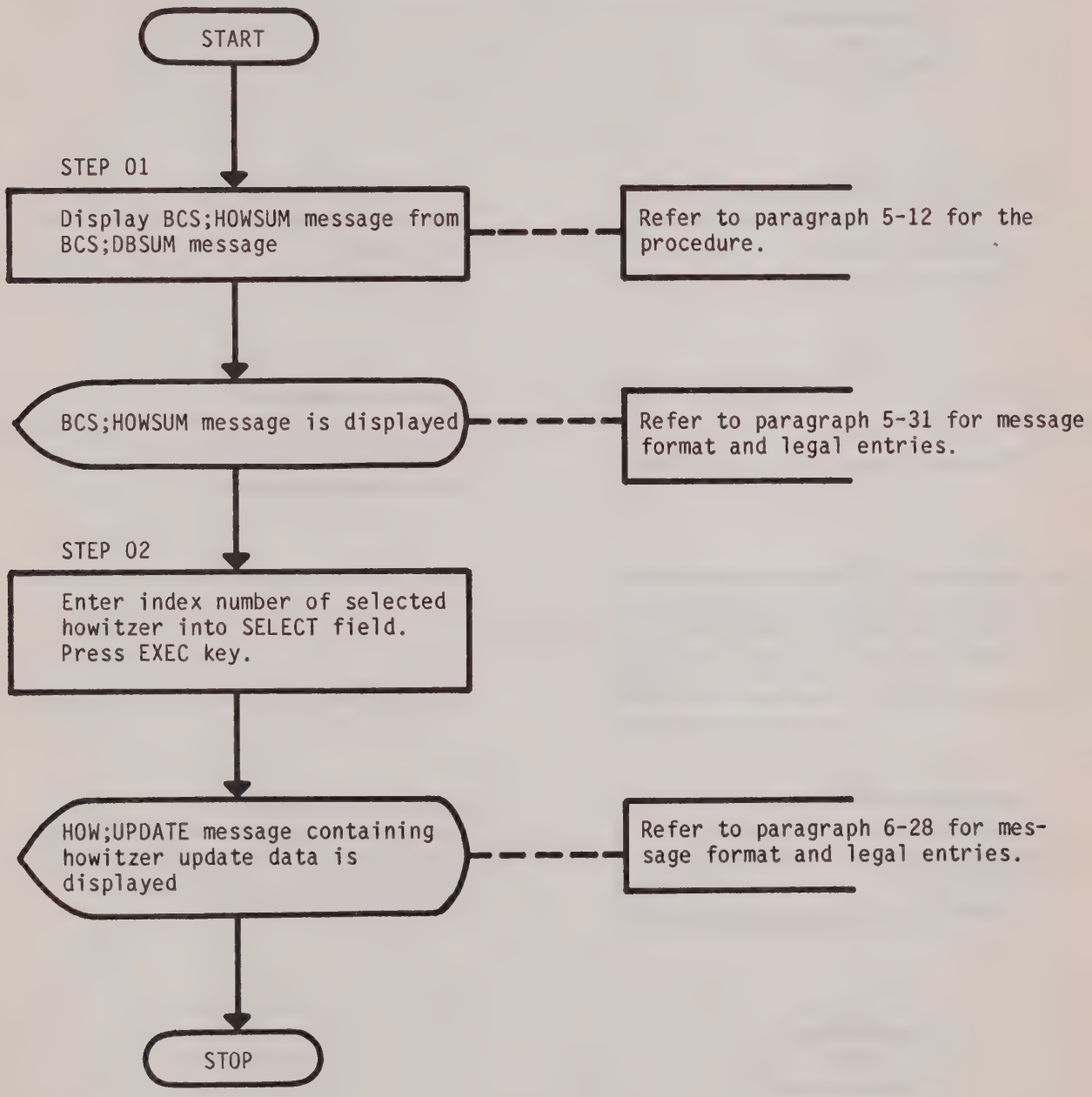
5-13. DISPLAYING HOWITZER SUBSCRIBER DATA FROM THE BCS;HSBSUM MESSAGE (HIP)

Use this flowchart to display howitzer subscriber data from the BCS;HSBSUM message.


START
STEP 01
Display BCS;HSBSUM message from BCS;DBSUM message
Refer to paragraph 5-12 for the procedure.
BCS;HSBSUM message is displayed
Refer to paragraph 5-30 for message format and legal entries.
STEP 02
Enter index number of selected howitzer into SELECT field. Press EXEC key.
HOW;SBT message containing howitzer subscriber data is displayed
Refer to paragraph 4-14 for message format and legal entries. If this is the first time the HOW;SBT message is displayed, the only subscriber data contained in the message will be the BCS platoon logical name.
STOP

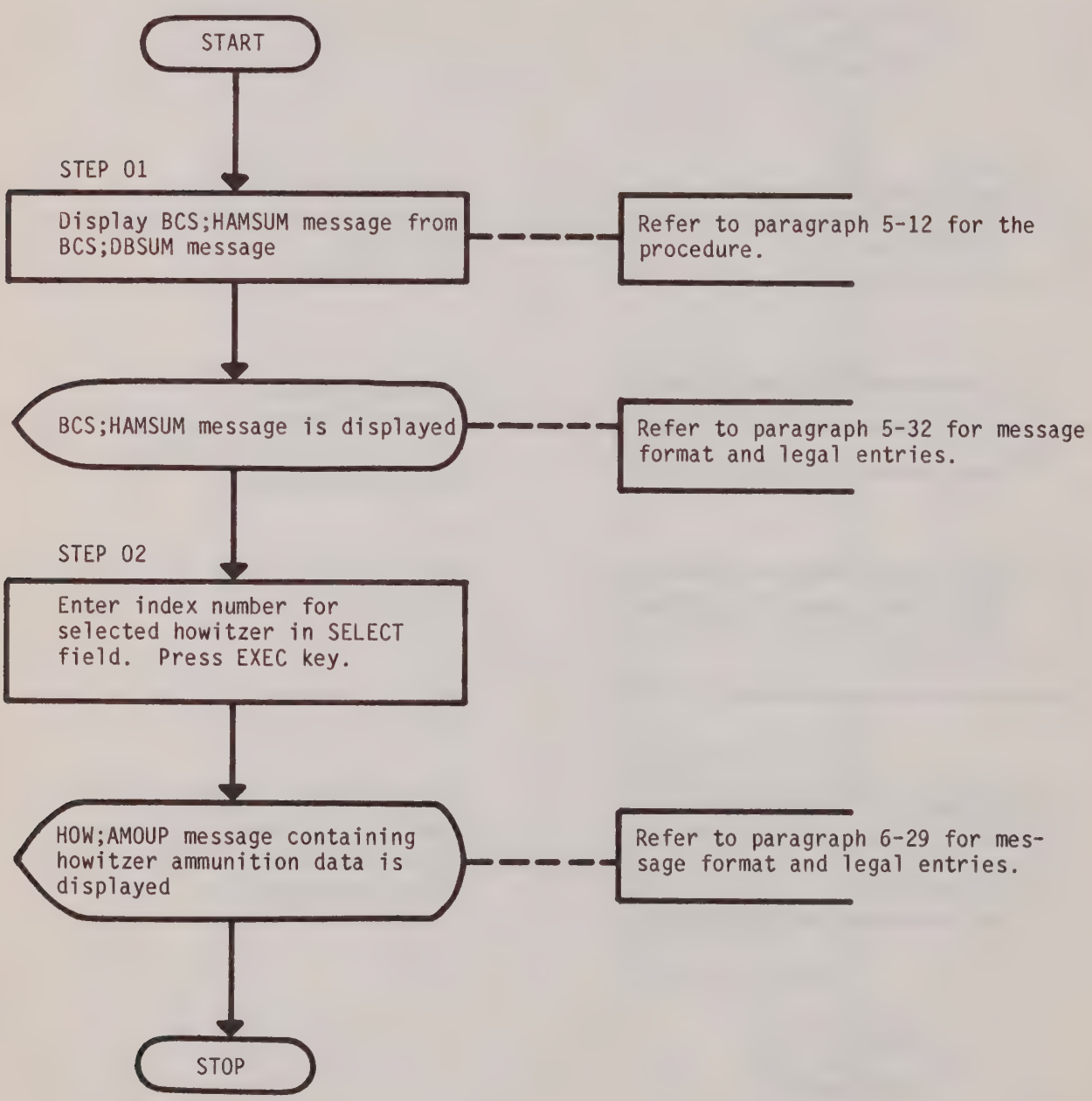
5-14. DISPLAYING HOWITZER UPDATE DATA FROM THE BCS;HOWSUM MESSAGE (HIP)

Use this flowchart to display howitzer update data from the BCS;HOWSUM message.


START
STEP 01
Display BCS;HOWSUM message from BCS;DBSUM message
Refer to paragraph 5-12 for the procedure.
BCS;HOWSUM message is displayed
Refer to paragraph 5-31 for message format and legal entries.
STEP 02
Enter index number of selected howitzer into SELECT field. Press EXEC key.
HOW;UPDATE message containing howitzer update data is displayed
Refer to paragraph 6-28 for message format and legal entries.
STOP

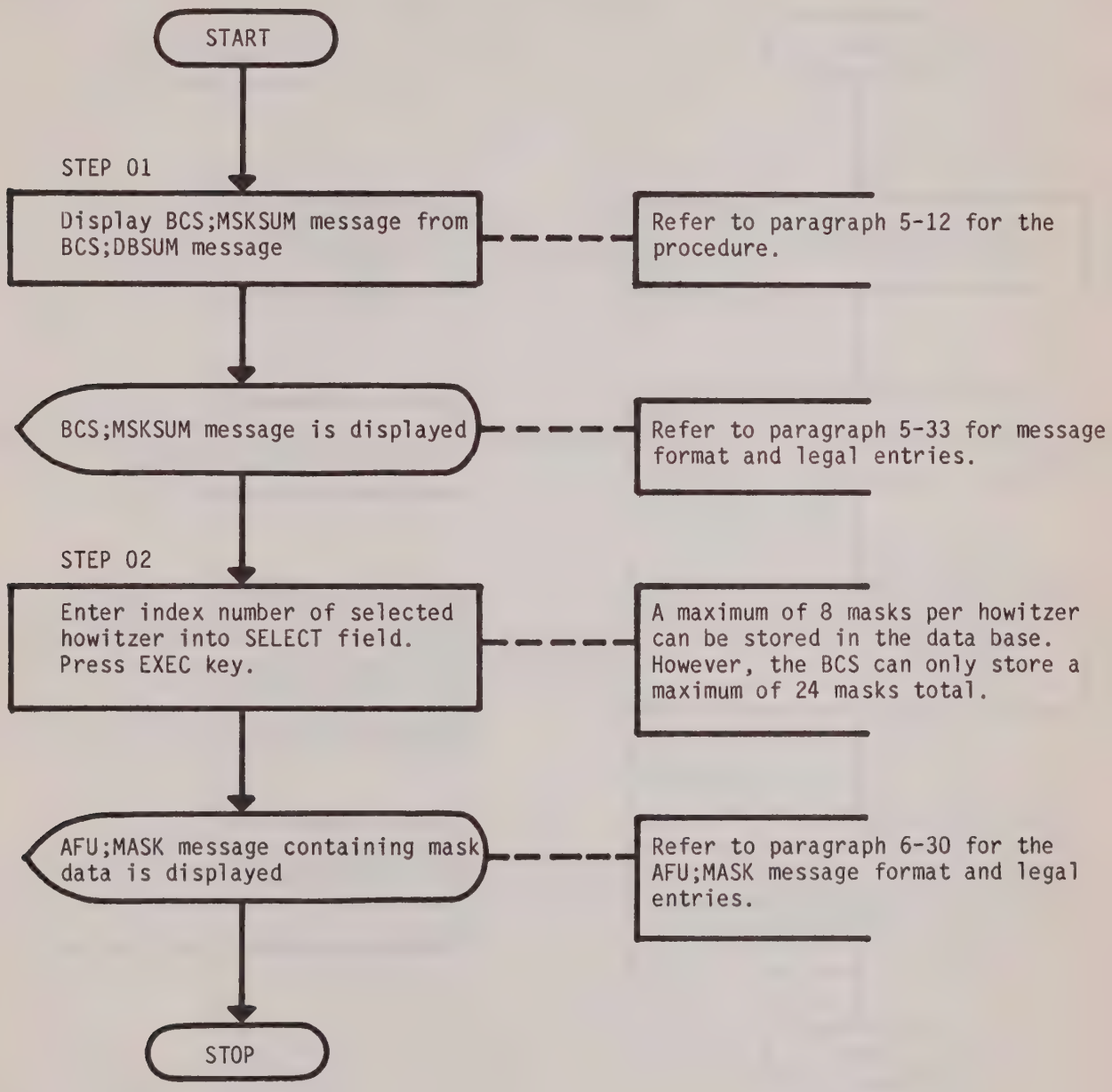
5-15. DISPLAYING HOWITZER AMMUNITION DATA FROM THE BCS;HAMSUM MESSAGE (HIP)

Use this flowchart to display howitzer ammunition data from the BCS;HAMSUM message.


START
STEP 01
Display BCS;HAMSUM message from BCS;DBSUM message
Refer to paragraph 5-12 for the procedure.
BCS;HAMSUM message is displayed
Refer to paragraph 5-32 for message format and legal entries.
STEP 02
Enter index number for selected howitzer in SELECT field. Press EXEC key.
HOW;AMOUP message containing howitzer ammunition data is displayed
Refer to paragraph 6-29 for message format and legal entries.
STOP

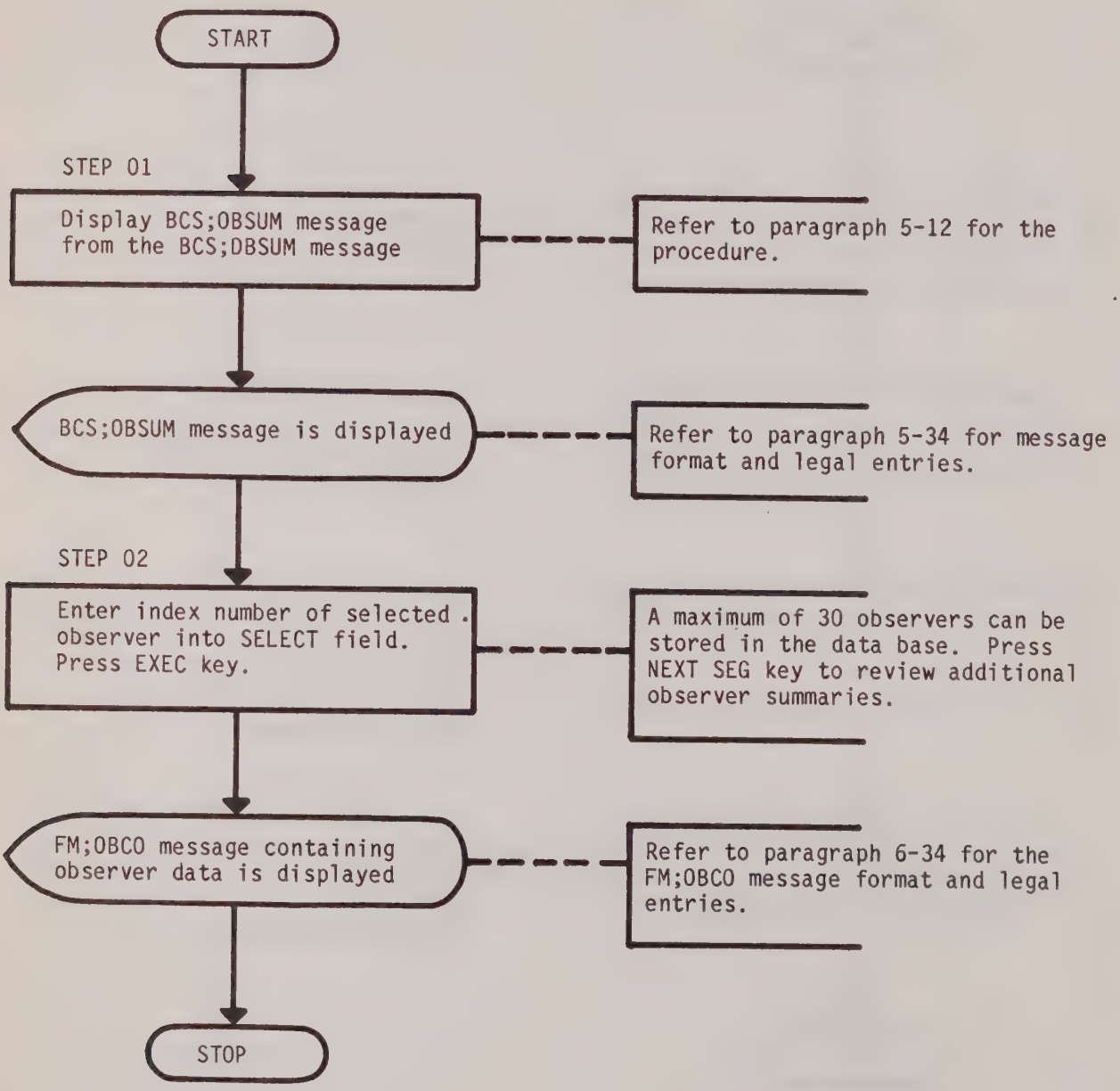
5-16. DISPLAYING MASK DATA FROM THE BCS;MSKSUM MESSAGE

Use this flowchart to display mask data from the BCS;MSKSUM message.


START
STEP 01
Display BCS;MSKSUM message from BCS;DBSUM message
Refer to paragraph 5-12 for the procedure.
BCS;MSKSUM message is displayed
Refer to paragraph 5-33 for message format and legal entries.
STEP 02
Enter index number of selected howitzer into SELECT field. Press EXEC key.
A maximum of 8 masks per howitzer can be stored in the data base. However, the BCS can only store a maximum of 24 masks total.
AFU;MASK message containing mask data is displayed
Refer to paragraph 6-30 for the AFU;MASK message format and legal entries.
STOP

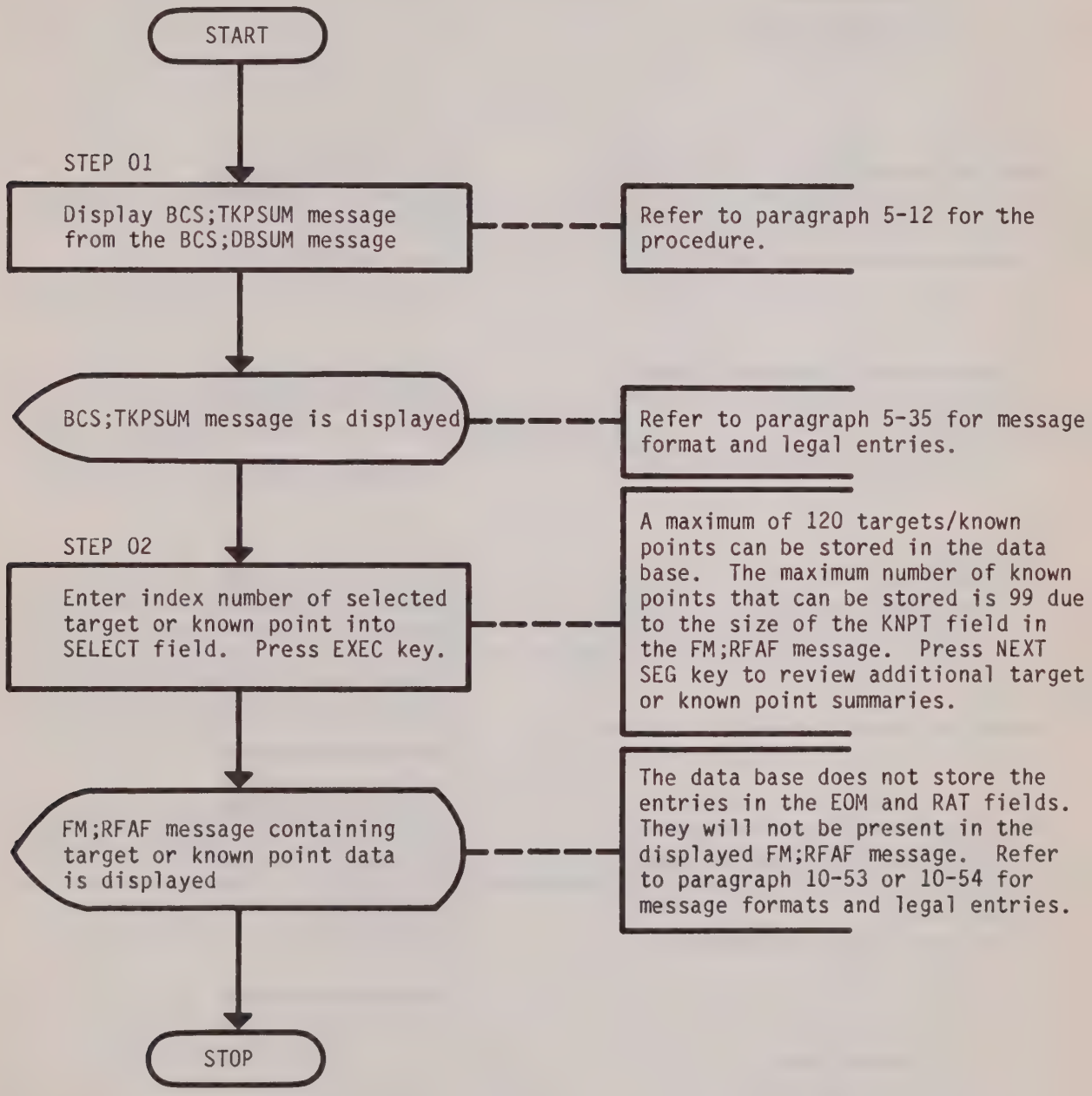
5-17. DISPLAYING OBSERVER DATA FROM THE BCS;OBSUM MESSAGE

Use this flowchart to display observer data from the BCS;OBSUM message.


START
STEP 01
Display BCS;OBSUM message from the BCS;DBSUM message
Refer to paragraph 5-12 for the procedure.
BCS;OBSUM message is displayed
Refer to paragraph 5-34 for message format and legal entries.
STEP 02
Enter index number of selected observer into SELECT field. Press EXEC key.
A maximum of 30 observers can be stored in the data base. Press NEXT SEG key to review additional observer summaries.
FM;OBCO message containing observer data is displayed
Refer to paragraph 6-34 for the FM;OBCO message format and legal entries.
STOP

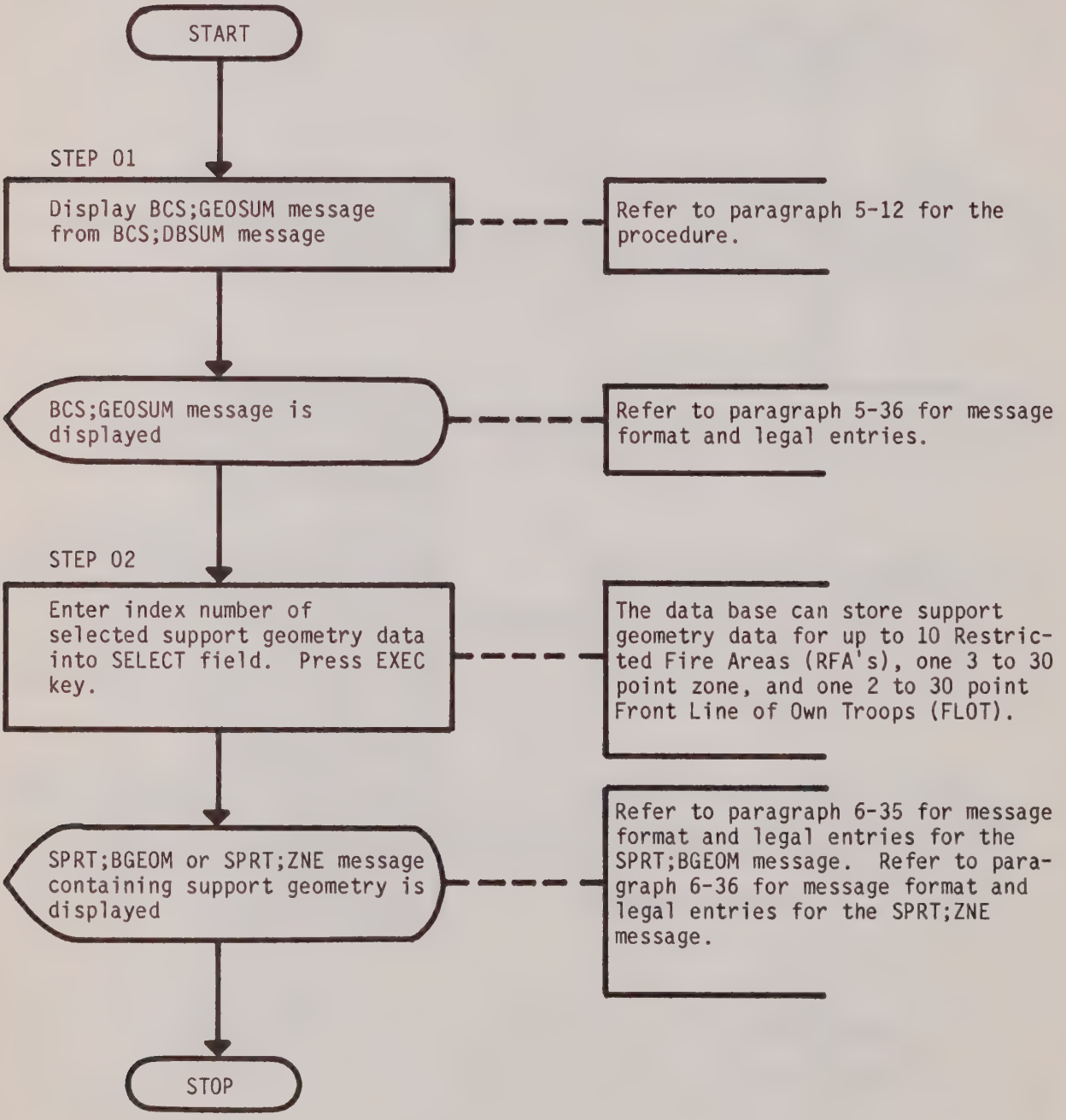
5-18. DISPLAYING TARGET OR KNOWN POINT DATA FROM THE BCS;TKPSUM MESSAGE

Use this flowchart to display target or known point data from the BCS;TKPSUM message.


START
STEP 01
Display BCS;TKPSUM message from the BCS;DBSUM message
Refer to paragraph 5-12 for the procedure.
BCS;TKPSUM message is displayed
Refer to paragraph 5-35 for message format and legal entries.
STEP 02
Enter index number of selected target or known point into SELECT field. Press EXEC key.
A maximum of 120 targets/known points can be stored in the data base. The maximum number of known points that can be stored is 99 due to the size of the KNPT field in the FM;RFAF message. Press NEXT SEG key to review additional target or known point summaries.
FM;RFAF message containing target or known point data is displayed
The data base does not store the entries in the EOM and RAT fields. They will not be present in the displayed FM;RFAF message. Refer to paragraph 10-53 or 10-54 for message formats and legal entries.
STOP

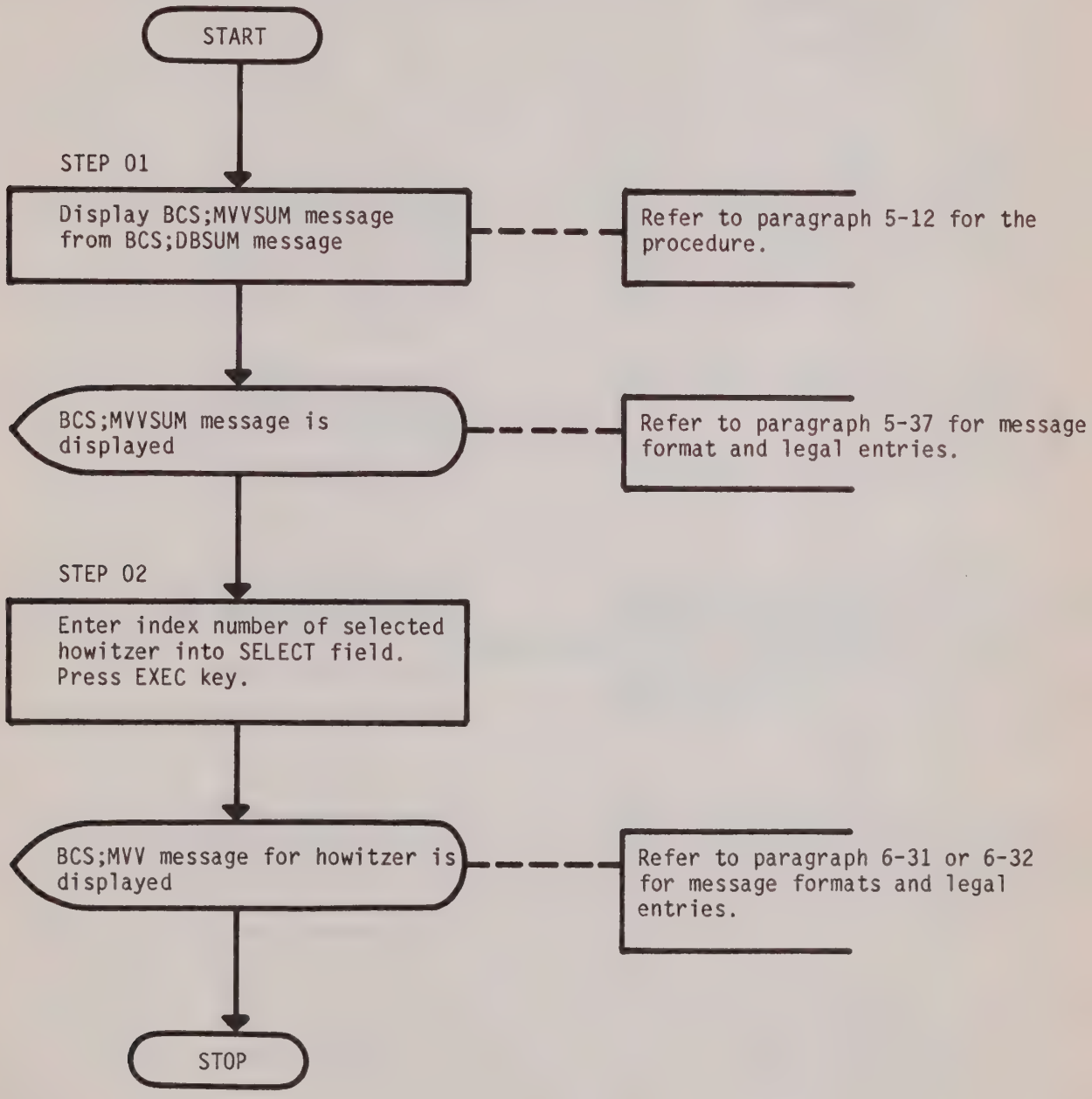
5-19. DISPLAYING GEOMETRY DATA FROM THE BCS;GEOSUM MESSAGE

Use this flowchart to display support geometry data from the BCS;GEOSUM message.


START
STEP 01
Display BCS;GEOSUM message from BCS;DBSUM message
Refer to paragraph 5-12 for the procedure.
BCS;GEOSUM message is displayed
Refer to paragraph 5-36 for message format and legal entries.
STEP 02
Enter index number of selected support geometry data into SELECT field. Press EXEC key.
The data base can store support geometry data for up to 10 Restricted Fire Areas (RFA's), one 3 to 30 point zone, and one 2 to 30 point Front Line of Own Troops (FLOT).
SPRT;BGEOM or SPRT;ZNE message containing support geometry is displayed
Refer to paragraph 6-35 for message format and legal entries for the SPRT;BGEOM message. Refer to paragraph 6-36 for message format and legal entries for the SPRT;ZNE message.
STOP

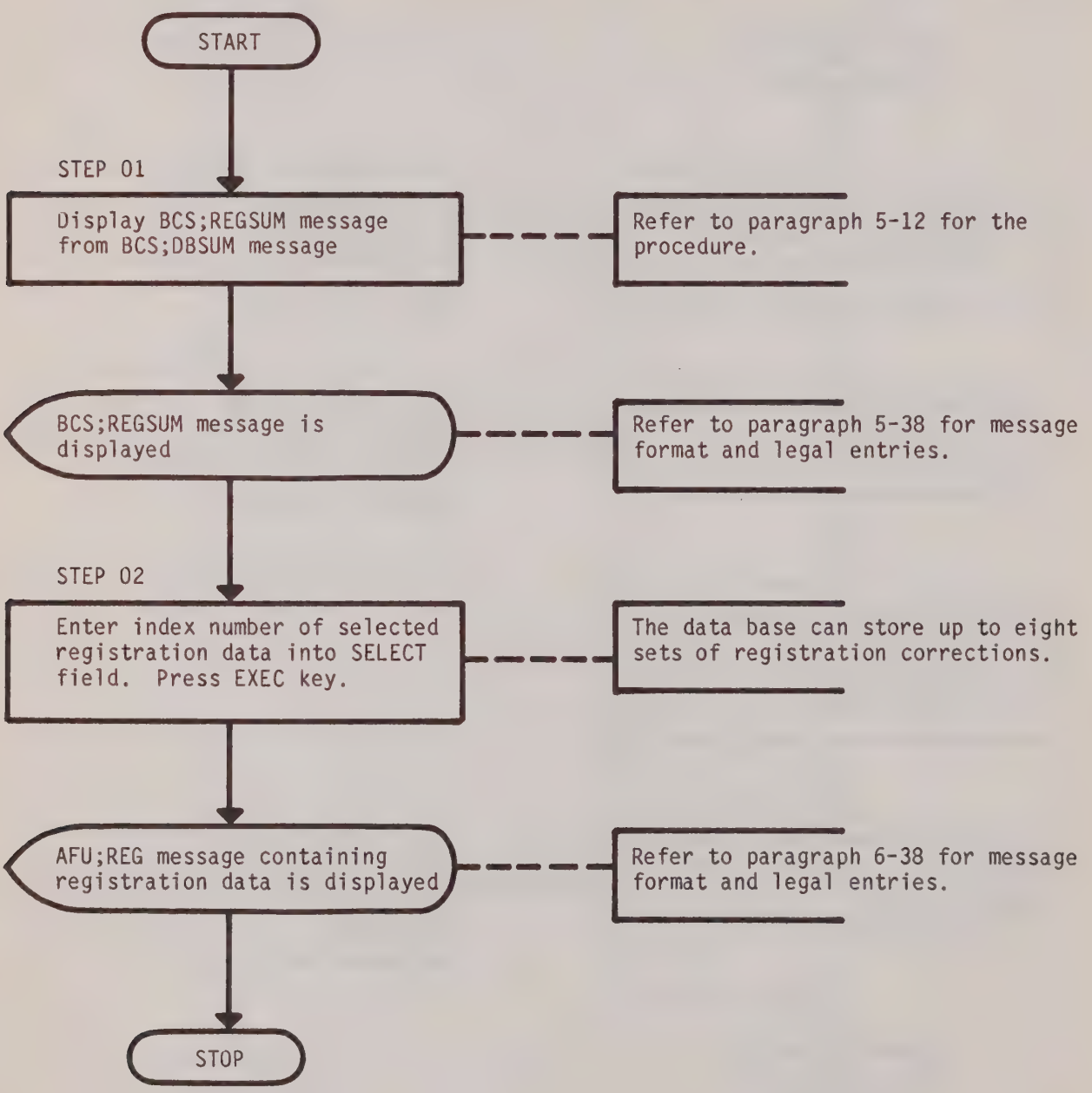
5-20. DISPLAYING MUZZLE VELOCITY VARIATION DATA FROM THE BCS;MVVSUM MESSAGE

Use this flowchart to display Muzzle Velocity Variation (MVV) data from the BCS;MVVSUM message.


START
STEP 01
Display BCS;MVVSUM message from BCS;DBSUM message
Refer to paragraph 5-12 for the procedure.
BCS;MVVSUM message is displayed
Refer to paragraph 5-37 for message format and legal entries.
STEP 02
Enter index number of selected howitzer into SELECT field. Press EXEC key.
BCS;MVV message for howitzer is displayed
Refer to paragraph 6-31 or 6-32 for message formats and legal entries.
STOP

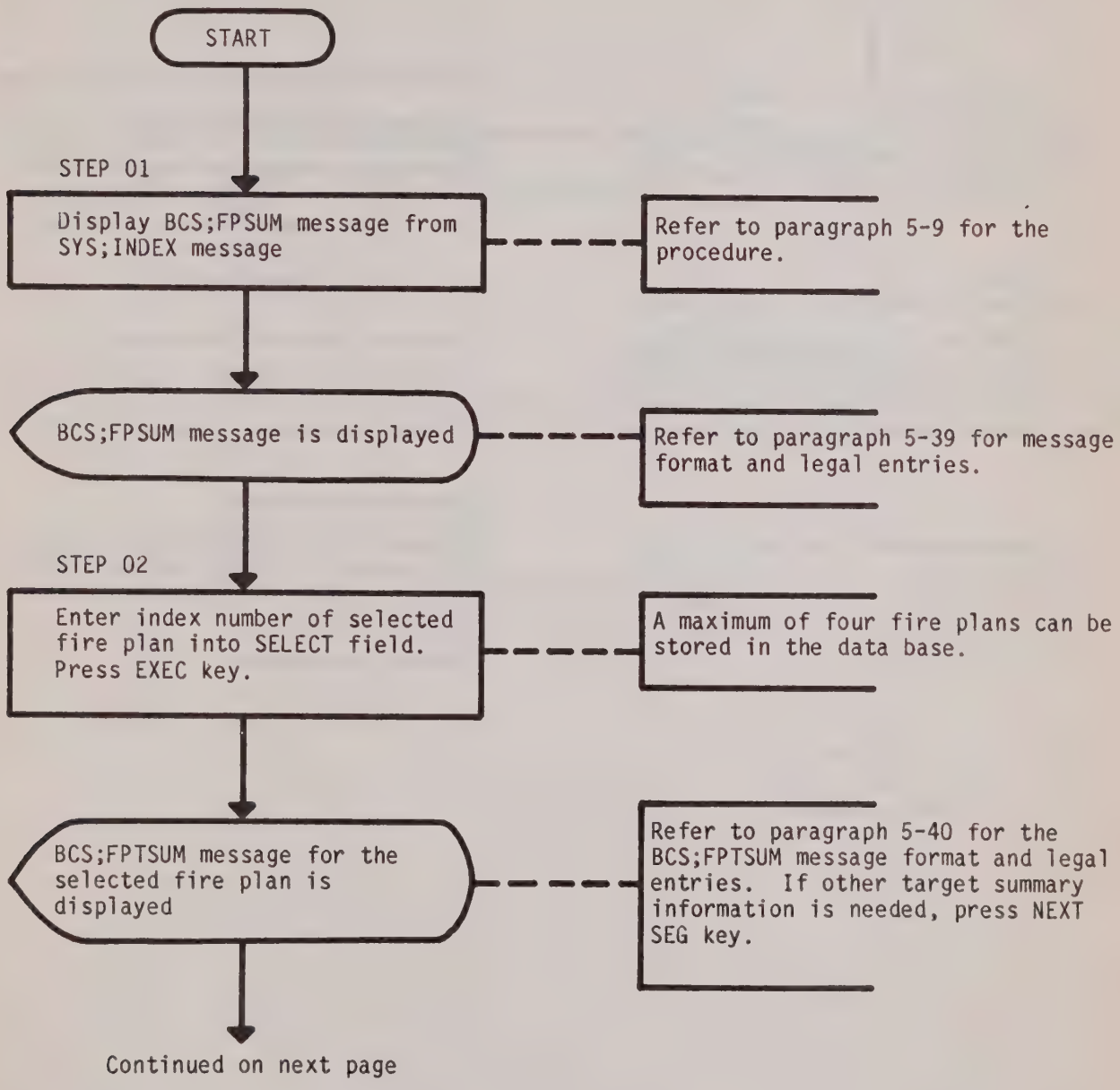
5-21. DISPLAYING REGISTRATION DATA FROM THE BCS;REGSUM MESSAGE

Use this flowchart to display registration data from the BCS;REGSUM message.

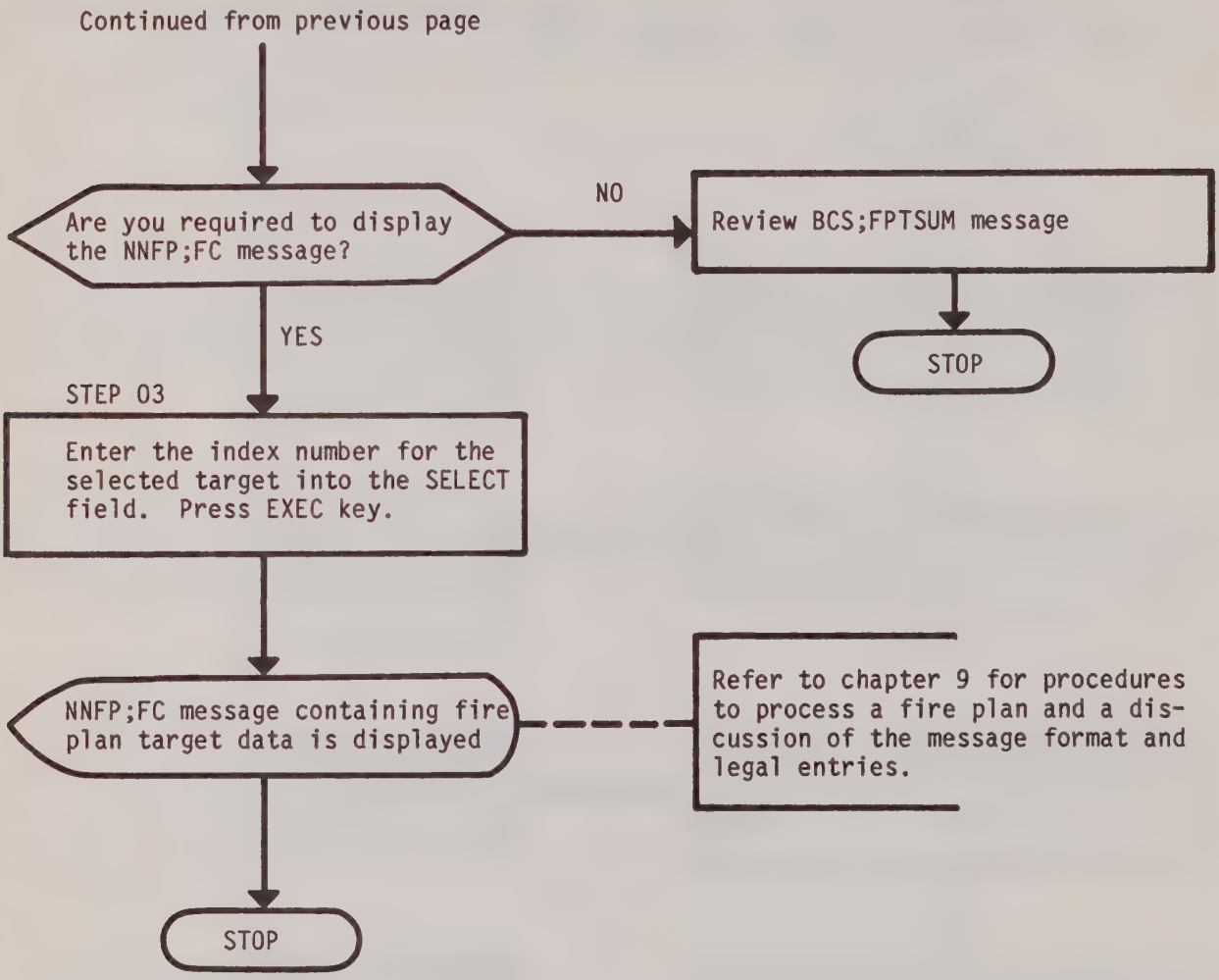

START
STEP 01
Display BCS;REGSUM message from BCS;DBSUM message
Refer to paragraph 5-12 for the procedure.
BCS;REGSUM message is displayed
Refer to paragraph 5-38 for message format and legal entries.
STEP 02
Enter index number of selected registration data into SELECT field. Press EXEC key.
The data base can store up to eight sets of registration corrections.
AFU;REG message containing registration data is displayed
Refer to paragraph 6-38 for message format and legal entries.
STOP

5-22. DISPLAYING FIRE PLAN DATA FROM THE BCS;FPSUM MESSAGE AND FIRE PLAN TARGET DATA FROM THE BCS;FPTSUM MESSAGE

Use this flowchart to display a fire plan from the BCS;FPSUM message and to display fire plan target data from the BCS;FPTSUM message.

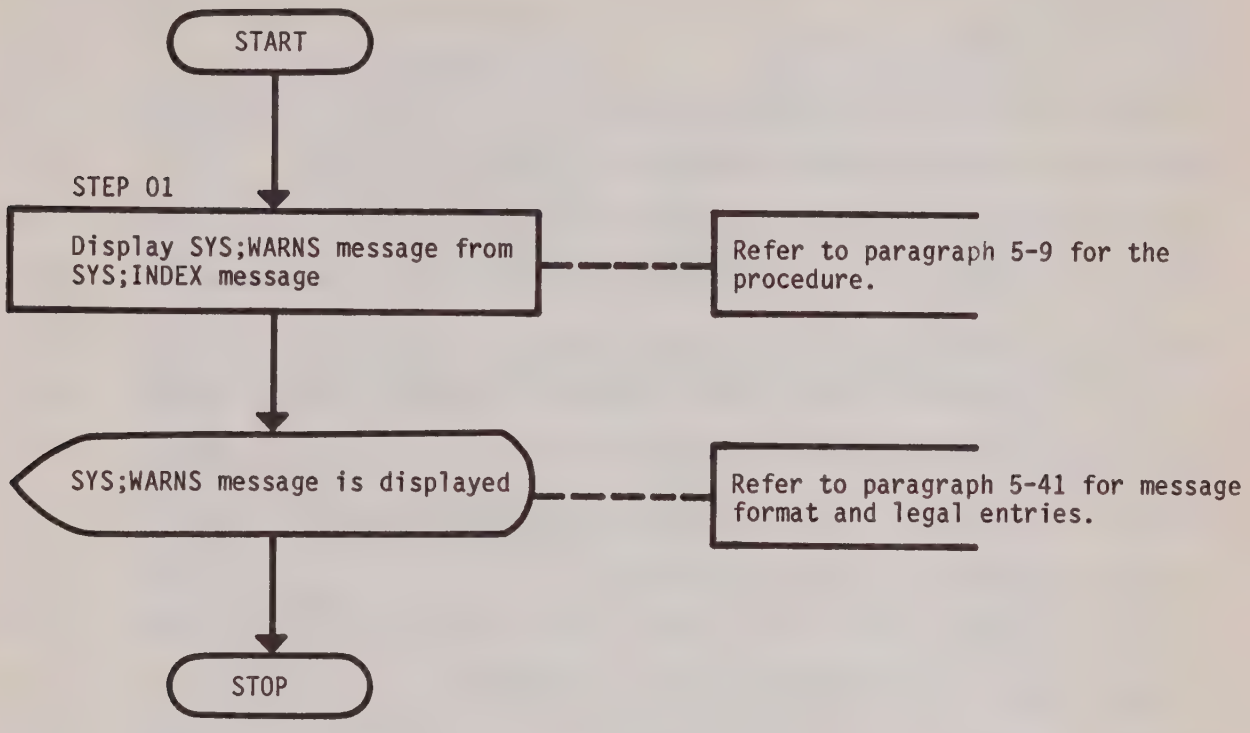

START
STEP 01
Display BCS;FPSUM message from SYS;INDEX message
Refer to paragraph 5-9 for the procedure.
BCS;FPSUM message is displayed
Refer to paragraph 5-39 for message format and legal entries.
STEP 02
Enter index number of selected fire plan into SELECT field. Press EXEC key.
A maximum of four fire plans can be stored in the data base.
BCS;FPTSUM message for the selected fire plan is displayed
Refer to paragraph 5-40 for the BCS;FPTSUM message format and legal entries. If other target summary information is needed, press NEXT SEG key.
Continued on next page

5-22. DISPLAYING FIRE PLAN DATA FROM THE BCS;FPSUM MESSAGE AND FIRE PLAN TARGET DATA FROM THE BCS;FPTSUM MESSAGE - CONTINUED


Continued from previous page
Are you required to display the NNFP;FC message?
NO
Review BCS;FPTSUM message
STOP
YES
STEP 03
Enter the index number for the selected target into the SELECT field. Press EXEC key.
NNFP;FC message containing fire plan target data is displayed
Refer to chapter 9 for procedures to process a fire plan and a discussion of the message format and legal entries.
STOP

5-23. DISPLAYING SYSTEM WARNINGS FROM THE SYS;WARNS MESSAGE

Use this flowchart to display system warnings from the SYS;WARNS message.


START
STEP 01
Display SYS;WARNS message from SYS;INDEX message
Refer to paragraph 5-9 for the procedure.
SYS;WARNS message is displayed
Refer to paragraph 5-41 for message format and legal entries.
STOP

Section III. INDEX AND SUMMARY MESSAGE FORMATS

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5-24. SYSTEM INDEX MESSAGE (SYS;INDEX)

a. Purpose. The SYS;INDEX message is the main point for entering the system. It displays the date/time group of the last data base recording, the target number block, and the next target number for automatic selection. It allows you to select one of the BCS functions it lists. You can use it to:

- display the SYS;IQSUM message
- display the SYS;MSGSUM message

5-24. SYSTEM INDEX MESSAGE (SYS;INDEX) - CONTINUED

- display the BCS;DBSUM message
- display the BCS;FPSUM message
- display the SYS;SETUP message
- display the SYS;WARNS message
- process a fire plan group entry.

b. Source. The SYS;INDEX message is displayed when the INDEX key is pressed. It is also automatically displayed after processing of certain messages is completed.

c. Input. Enter the index number corresponding to the function you wish to access into the SELECT field.

d. Computer Processing. Pressing the EXEC key causes the following processing:

- If index numbers 1 through 4 and 6 are entered into the SELECT field, a summary or index is displayed.
- If index number 5 is entered into the SELECT field, the initialization sequence messages are displayed.
- If index number 7 is entered into the SELECT field, a fire plan group entry takes place. (Refer to paragraphs 9-2 and 9-8.)

e. Output. The output depends on the index number entered into the SELECT field:

- When 1 is selected, the SYS;IQSUM message is output.
- When 2 is selected, the SYS;MSGSUM message is output.
- When 3 is selected, the BCS;DBSUM message is output.
- When 4 is selected, the BCS;FPSUM message is output.
- When 5 is selected, the SYS;SETUP message is output.
- When 6 is selected, the SYS;WARNS message is output.
- When 7 is selected, a fire plan group entry takes place.

f. Message Format and Legal Entries. The following SYS;INDEX message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

5-24. SYSTEM INDEX MESSAGE (SYS;INDEX) - CONTINUED

```
SYS;INDEX;C:___;
  1:INPUT QUEUE
  2:MESSAGE SKELETONS
  3:DATA BASE
  4:FIRE PLANS                        _ OF 4
  5:SYSTEM SETUP/SUBSCRIBERS          __ OF 72
  6:SYSTEM WARNINGS                   __ OF 12
  7:FIRE PLAN GROUP ENTRY
  LAST DATA BASE RECORDING            __/___/__ __/__/__  (_)
  TARGET NUMBER BLOCK                 ______/____
  NEXT TARGET NUMBER                  ______
SELECT:__;
```

SYS;INDEX; C:___;

SYS;INDEX identifies the message as the system index message.

SYS;INDEX; **C:___;**

C indicates the message security classification. Legal entries are listed in appendix H.

Default = UN (unclassified)

1:INPUT QUEUE

Index number 1 corresponds to the system input queue summary message. (Refer to paragraph 5-25.)

2:MESSAGE SKELETONS

Index number 2 corresponds to the system message skeleton summary message. (Refer to paragraphs 5-26 and 5-27.)

3:DATA BASE

Index number 3 corresponds to the data base summary message. (Refer to paragraphs 5-28 and 5-29.)

5-24. SYSTEM INDEX MESSAGE (SYS;INDEX) - CONTINUED

4:FIRE PLANS _ OF 4

Index number 4 corresponds to the fire plan summary message. (Refer to paragraph 5-39.) The number in the "_" position above indicates how many fire plans are stored in the data base. The number 4 indicates a maximum number of fire plans.

5:SYSTEM SETUP/SUBSCRIBERS __ OF 72

Index number 5 corresponds to the initialization sequence messages. These messages are the SYS;SETUP, SYS;COMM, and SYS;SBT messages. (Refer to paragraphs 4-10, 4-11, 4-12, and 4-13.) You use this to update initialization data after the BCS has been initialized. The number in the "__" position above indicates how many subscribers are stored in the data base. The number 72 indicates the maximum number of subscribers which can be stored in the data base.

6:SYSTEM WARNINGS __ OF 12

Index number 6 corresponds to the system warnings summary message. (Refer to paragraph 5-41.) The number in the "__" position indicates how many system warnings are stored in the SYS;WARNS message. The number 12 indicates the maximum number of system warnings which can be stored.

7:FIRE PLAN GROUP ENTRY

Index number 7 corresponds to the fire plan message group entry. A group entry is a one-step transfer of up to 10 NNFP;FC fire plan messages from the input queue to the fire plan file. (Refer to paragraphs 9-2 and 9-8.)

5-24. SYSTEM INDEX MESSAGE (SYS;INDEX) - CONTINUED

```
SYS;INDEX;C:___;
  1:INPUT QUEUE
  2:MESSAGE SKELETONS
  3:DATA BASE
  4:FIRE PLANS                        _ OF 4
  5:SYSTEM SETUP/SUBSCRIBERS          __ OF 72
  6:SYSTEM WARNINGS                   __ OF 12
  7:FIRE PLAN GROUP ENTRY
  LAST DATA BASE RECORDING            __/___/__ __/__/__  (_)
  TARGET NUMBER BLOCK                 ------/----
  NEXT TARGET NUMBER                  ------
SELECT:__;
```

LAST DATA BASE RECORDING	__/___/__ __/__/__ (_)

This line of the SYS;INDEX message indicates the system time when the last data base recording was made. You make no entry in this line. The information is displayed automatically by the BCS. If no data base has been recorded, these fields will be blank. Values displayed are:

__/ ___/__ __/__/__ (_)	Day	1 to 31
__/ ___/ __ __/__/__ (_)	Month	First three letters of month name
__/___/ __ __/__/__ (_)	Year	00 to 99
__/___/__ __/ __/__ (_)	Hour	00 to 23
__/___/__ __/ __/ __ (_)	Minute	00 to 59
__/___/__ __/__/ __ (_)	Second	00 to 59
__/___/__ __/__/__ (_)	Data base number	1 or 2

5-24. SYSTEM INDEX MESSAGE (SYS;INDEX) - CONTINUED

TARGET NUMBER BLOCK _____/____

This line of the SYS;INDEX message identifies the block of target numbers to be used. You make no entry in this line. The information is displayed automatically by the BCS based on what you enter into the TGTNO field of the SYS;SETUP message. Values displayed are:

_____/ ____	Lowest target number	Two letters followed by four numbers
_____/ ____	Highest target number	Four numbers. (The two letters in the previous subfield also apply to this subfield.)

NEXT TARGET NUMBER _____

This line of the SYS;INDEX message indicates the next target number which will be used for automatic assignment by the BCS. You make no entry in this line. This is a computer-generated entry. Values displayed are two letters followed by four numbers.

SELECT:__;

SELECT is used to display one of the seven options listed above. This is a required entry. Legal entries are 1 to 7.

---

g. Exploded View. Not applicable.

5-25. SYSTEM INPUT QUEUE SUMMARY MESSAGE (SYS;IQSUM)

a. Purpose. The SYS;IQSUM message is used to review the messages awaiting your action in the input queue. It displays a list of the messages stored in the input queue and allows you to select one of them for display. If there are more than 10 messages in the input queue, more than 1 segment of the SYS;IQSUM message will be used. When a message is placed in the input queue, an alarm will sound and a message lamp will light. Message ordering in the input queue is established according to which message lamp lights. Messages are placed in the input queue in the order shown below.

(1) CHK FIRE lamp (check firing messages)

(2) FIRE MSN lamp (fire mission messages) (fire mission messages are ordered further based on the entry in the PRI field. The order is as follows: 1 - urgent, 2 - priority, and blank - normal.)

(3) MSG RCVD lamp (other messages)

Messages of the same group or fire mission subgroup are listed in the SYS;IQSUM message according to the time of arrival with the most recent message placed at the bottom.

b. Source. The SYS;IQSUM message is displayed when you quickly press the RCVD MSG key twice. You may also display it from the SYS;INDEX message.

c. Input. Enter into the SELECT field of the SYS;IQSUM message the index number corresponding to the message which you wish to display, delete, transmit, or print. Press the appropriate key.

d. Computer Processing. Pressing the EXEC key causes the BCS to generate for display the message which corresponds to the index number entered into the SELECT field. Pressing the DELETE key deletes the message that corresponds to the index number entered in the SELECT field. Pressing the XMIT key transmits the message that corresponds to the index number entered in the SELECT field. Pressing the PRINT key prints the message that corresponds to the index number in the SELECT field, if a printer is available.

e. Output. The output is as follows:

- message selected from input queue
- first page of the SYS;IQSUM message when DELETE or XMIT key is pressed and there are more messages in the input queue.
- SYS;INDEX message when DELETE or XMIT key is pressed and there are no messages left in the input queue.
- the page of the SYS;IQSUM message that you are on is redisplayed when the PRINT key is pressed.

5-25. SYSTEM INPUT QUEUE SUMMARY MESSAGE (SYS;IQSUM) - CONTINUED

f. Message Format and Legal Entries. The following SYS;IQSUM message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
SYS;IQSUM;C:___;
   MESSAGE      SUBSCRIBER    STATUS   P    HEADER    DAY,TIME
 1:____;______ _/_/_/__/___  ______   -   ______   __,__/__/__
 2:____;______ _/_/_/__/___  ______   -   ______   __,__/__/__
 3:____;______ _/_/_/__/___  ______   -   ______   __,__/__/__
 4:____;______ _/_/_/__/___  ______   -   ______   __,__/__/__
 5:____;______ _/_/_/__/___  ______   -   ______   __,__/__/__
 6:____;______ _/_/_/__/___  ______   -   ______   __,__/__/__
 7:____;______ _/_/_/__/___  ______   -   ______   __,__/__/__
 8:____;______ _/_/_/__/___  ______   -   ______   __,__/__/__
 9:____;______ _/_/_/__/___  ______   -   ______   __,__/__/__
10:____;______ _/_/_/__/___  ______   -   ______   __,__/__/__
SELECT:__;
```

SYS;IQSUM; C:___;

SYS;IQSUM identifies the message as the system input queue summary message.

SYS;IQSUM; **C:___;**

C indicates the security classification of the message. Legal entries are listed in appendix H.

Default = UN (unclassified)

MESSAGE
1:____;______ SUBSCRIBER _/_/_/__/___ STATUS ______ P - HEADER ______ DAY,TIME __,__/__/__

The MESSAGE column displays the name of the message that is stored in the input queue. The number under the column heading identifies where each message is located. Values displayed are A through Z.

5-25. SYSTEM INPUT QUEUE SUMMARY MESSAGE (SYS;IQSUM) - CONTINUED

```
  MESSAGE       | SUBSCRIBER | STATUS P HEADER   DAY,TIME
1:____;______   | _/_/_/__/___ | ------ - ------  __,__/__/__
```

The SUBSCRIBER column displays the logical subscriber name of the message originator. Values displayed are A through Z and 0 through 9.

```
  MESSAGE       SUBSCRIBER   | STATUS | P HEADER   DAY,TIME
1:____;______   _/_/_/__/___ | ------ | - ------  __,__/__/__
```

The STATUS column displays the status of the received message. Values displayed are:

RELAY	- relay message
ERROR	- error attached to message
UNK	- unrecognized category and/or type
F PLAN	- message retrieved from fire plan file
LFPT	- last fire plan target
RSTART	- message was in transmit queue and moved to input queue on warmstart
C ILL	- coordinated illumination message
RCVD	- all other received messages
XMIT	- message was posted in the input queue for manual transmission (HIP only)

```
  MESSAGE       SUBSCRIBER   STATUS | P | HEADER   DAY,TIME
1:____;______   _/_/_/__/___ ------ | - | ------  __,__/__/__
```

The P column displays the fire mission priority when an FM;RFAF or FM;FC message is received in the input queue. All other messages will be blank. Values displayed are:

1	- urgent
2	- priority
blank	- normal

```
  MESSAGE       SUBSCRIBER   STATUS P | HEADER | DAY,TIME
1:____;______   _/_/_/__/___ ------ - | ------ | __,__/__/__
```

The HEADER column displays the data in the header of the comm line (paragraph 3-7) of the message in the input queue.

5-25. SYSTEM INPUT QUEUE SUMMARY MESSAGE (SYS;IQSUM) - CONTINUED

```
SYS;IQSUM;C:___;
    MESSAGE      SUBSCRIBER    STATUS   P   HEADER   DAY,TIME
 1:____;______ _/_/_/__/___   ______   -   ______   __,__/__/__
 2:____;______ _/_/_/__/___   ______   -   ______   __,__/__/__
 3:____;______ _/_/_/__/___   ______   -   ______   __,__/__/__
 4:____;______ _/_/_/__/___   ______   -   ______   __,__/__/__
 5:____;______ _/_/_/__/___   ______   -   ______   __,__/__/__
 6:____;______ _/_/_/__/___   ______   -   ______   __,__/__/__
 7:____;______ _/_/_/__/___   ______   -   ______   __,__/__/__
 8:____;______ _/_/_/__/___   ______   -   ______   __,__/__/__
 9:____;______ _/_/_/__/___   ______   -   ______   __,__/__/__
10:____;______ _/_/_/__/___   ______   -   ______   __,__/__/__
SELECT:__;
```

```
  MESSAGE       SUBSCRIBER   STATUS P HEADER | DAY,TIME   |
1:____;______ _/_/_/__/___   ______ - ______ | __,__/__/__ |
```

The DAY,TIME column displays the date and time the message was received. Values displayed are:

DAY, __, TIME __/__/__	Day of month	1 to 31
DAY, __, TIME __/__/__	Current system time	
__/ __/__	Hour	00 to 23
__/ __/ __	Minutes	00 to 59
__/__/ __	Seconds	00 to 59

```
SELECT:__;
```

You enter in the SELECT field the index number of the message to be displayed, printed, transmitted, or deleted.

---

g. Exploded View. Not applicable.

5-26. SYSTEM MESSAGE SKELETON SUMMARY MESSAGE (SYS;MSGSUM) (NON-HIP)

a. Purpose. This message is for operator review for selection of message skeletons for display.

b. Source. The SYS;MSGSUM message is displayed from the SYS;INDEX message.

c. Input. Enter into the SELECT field the index number corresponding to the specific message skeleton you wish to display. Press the EXEC key.

d. Computer Processing. Pressing the EXEC key causes the BCS to generate for display the message skeleton corresponding to the index number entered.

e. Output. The outputs for the SYS;MSGSUM message are as follows:

Index Number Input	Output Message Skeleton
1	FM;CHECK
2	FM;RFAF
3	FM;SUBS
4	FM;INTM
5	FM;QF
6	FM;FOCMD
7	FM;OBCO
8	FM;MTO
9	AFU;BAMOUP
10	AFU;MASK
11	AFU;REG
12	AFU;MV
13	BCS;MVD
14	BCS;COMD
15	SPRT;BGEOM
16	SPRT;ZNE
17	SPRT;LOC
18	NNFP;FC
19	MET;CM
20	ATI;AZR
21	ATI;CDR
22	ATI;SHR
23	SYS;RING
24	SYS;PTM

5-26. SYSTEM MESSAGE SKELETON SUMMARY MESSAGE (SYS;MSGSUM) (NON-HIP) - CONTINUED

f. Message Format and Legal Entries. The following SYS;MSGSUM message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
SYS;MSGSUM;C:___;
  1:FM;CHECK          9:AFU;BAMOUP        17:SPRT;LOC
  2:FM;RFAF          10:AFU;MASK          18:NNFP;FC
  3:FM;SUBS          11:AFU;REG           19:MET;CM
  4:FM;INTM          12:AFU;MV            20:ATI;AZR
  5:FM;QF            13:BCS;MVD           21:ATI;CDR
  6:FM;FOCMD         14:BCS;COMD          22:ATI;SHR
  7:FM;OBCO          15:SPRT;BGEOM        23:SYS;RING
  8:FM;MTO           16:SPRT;ZNE          24:SYS;PTM


SELECT:__;
```

SYS;MSGSUM; C:___;

SYS;MSGSUM identifies the message as the system message skeleton summary message.

SYS;MSGSUM; **C:___;**

C indicates the security classification of the message. Legal entries are listed in appendix H.

Default = UN (unclassified)

1:FM;CHECK

Index number 1 corresponds to the check firing command output message. This message is identified by the mnemonic FM;CHECK. (Refer to paragraph 10-66 for the message format and legal entries.)

2:FM;RFAF

Index number 2 corresponds to the fire mission input message. This message is identified by the mnemonic FM;RFAF. (Refer to paragraph 10-53 for the message format and legal entries.)

5-26. SYSTEM MESSAGE SKELETON SUMMARY MESSAGE (SYS;MSGSUM) (NON-HIP) - CONTINUED

3:FM;SUBS

Index number 3 corresponds to the subsequent commands input message. This message is identified by the mnemonic FM;SUBS. (Refer to paragraph 10-62 for the message format and legal entries.)

4:FM;INTM

Index number 4 corresponds to the high burst or mean point of impact fire mission input message. This message is identified by the mnemonic FM;INTM. (Refer to paragraph 10-59 for the message format and legal entries.)

5:FM;QF

Index number 5 corresponds to the quick response fire request message. This message is identified by the mnemonic FM;QF. (Refer to paragraph 10-58 for the message format and legal entries.)

6:FM;FOCMD

Index number 6 corresponds to the forward observer command message. This message is identified by the mnemonic FM;FOCMD. (Refer to paragraph 10-61 for the message format and legal entries.)

7:FM;OBCO

Index number 7 corresponds to the observer location input message. This message is identified by the mnemonic FM;OBCO. (Refer to paragraph 6-34 for the message format and legal entries.)

8:FM;MTO

Index number 8 corresponds to the message to observer message. This message is identified by the mnemonic FM;MTO. (Refer to paragraph 10-60 for the message format and legal entries.)

5-26. SYSTEM MESSAGE SKELETON SUMMARY MESSAGE (SYS;MSGSUM) (NON-HIP) - CONTINUED

```
SYS;MSGSUM;C:___;
  1:FM;CHECK          9:AFU;BAMOUP        17:SPRT;LOC
  2:FM;RFAF          10:AFU;MASK          18:NNFP;FC
  3:FM;SUBS          11:AFU;REG           19:MET;CM
  4:FM;INTM          12:AFU;MV            20:ATI;AZR
  5:FM;QF            13:BCS;MVD           21:ATI;CDR
  6:FM;FOCMD         14:BCS;COMD          22:ATI;SHR
  7:FM;OBCO          15:SPRT;BGEOM        23:SYS;RING
  8:FM;MTO           16:SPRT;ZNE          24:SYS;PTM

SELECT:__;
```

9:AFU;BAMOUP

Index number 9 corresponds to the fire unit ammunition update message. This message is identified by the mnemonic AFU;BAMOUP. (Refer to paragraph 4-18 for the message format and legal entries.)

10:AFU;MASK

Index number 10 corresponds to the fire unit mask input message. This message is identified by the mnemonic AFU;MASK. (Refer to paragraph 6-30 for the message format and legal entries.)

11:AFU;REG

Index number 11 corresponds to the registration data input message. This message is identified by the mnemonic AFU;REG. (Refer to paragraph 6-38 for the message format and legal entries.)

12:AFU;MV

Index number 12 corresponds to the current muzzle velocity message. This message is identified by the mnemonic AFU;MV. (Refer to paragraph 7-23 for the message format and legal entries.)

5-26. SYSTEM MESSAGE SKELETON SUMMARY MESSAGE (SYS;MSGSUM) (NON-HIP) - CONTINUED

13:BCS;MVD

Index number 13 corresponds to the muzzle velocity derivation message. This message is identified by the mnemonic BCS;MVD. (Refer to paragraph 6-33 for the message format and legal entries.)

14:BCS;COMD

Index number 14 corresponds to the command input message. This message is identified by the mnemonic BCS;COMD. (Refer to paragraph 9-13 for the message format and legal entries.)

15:SPRT;BGEOM

Index number 15 corresponds to the support battlefield geometry message. This message is identified by the mnemonic SPRT;BGEOM. (Refer to paragraph 6-35 for the message format and legal entries.)

16:SPRT;ZNE

Index number 16 corresponds to the support zone message. This message is identified by the mnemonic SPRT;ZNE. (Refer to paragraph 6-36 for the message format and legal entries.)

17:SPRT;LOC

Index number 17 corresponds to the support locate message. This message is identified by the mnemonic SPRT;LOC. (Refer to paragraph 6-39 for the message format and legal entries.)

18:NNFP;FC

Index number 18 corresponds to the nuclear/nonnuclear fire plan input message. This message is identified by the mnemonic NNFP;FC. (Refer to paragraph 9-12 for the message format and legal entries.)

5-26. SYSTEM MESSAGE SKELETON SUMMARY MESSAGE (SYS;MSGSUM) (NON-HIP) - CONTINUED

```
SYS;MSGSUM;C:___;
  1:FM;CHECK          9:AFU;BAMOUP        17:SPRT;LOC
  2:FM;RFAF          10:AFU;MASK          18:NNFP;FC
  3:FM;SUBS          11:AFU;REG           19:MET;CM
  4:FM;INTM          12:AFU;MV            20:ATI;AZR
  5:FM;QF            13:BCS;MVD           21:ATI;CDR
  6:FM;FOCMD         14:BCS;COMD          22:ATI;SHR
  7:FM;OBCO          15:SPRT;BGEOM        23:SYS;RING
  8:FM;MTO           16:SPRT;ZNE          24:SYS;PTM

SELECT:__;
```

19:MET;CM

Index number 19 corresponds to the computer meteorological data message. This message is identified by the mnemonic MET;CM. (Refer to paragraph 6-37 for the message format and legal entries.)

20:ATI;AZR

Index number 20 corresponds to the azimuth distance report message. This message is identified by the mnemonic ATI;AZR. (Refer to paragraph 7-19 for the message format and legal entries.)

21:ATI;CDR

Index number 21 corresponds to the coordinates report message. The message is identified by the mnemonic ATI;CDR. (Refer to paragraph 7-18 for the message format and legal entries.)

22:ATI;SHR

Index number 22 corresponds to the shell report message. The message is identified by the mnemonic ATI;SHR. (Refer to paragraph 7-20 for the message format and legal entries.)

5-26. SYSTEM MESSAGE SKELETON SUMMARY MESSAGE (SYS;MSGSUM) (NON-HIP) - CONTINUED

```
SYS;MSGSUM;C:___;
  1:FM;CHECK          9:AFU;BAMOUP       17:SPRT;LOC
  2:FM;RFAF          10:AFU;MASK         18:NNFP;FC
  3:FM;SUBS          11:AFU;REG          19:MET;CM
  4:FM;INTM          12:AFU;MV           20:ATI;AZR
  5:FM;QF            13:BCS;MVD          21:ATI;CDR
  6:FM;FOCMD         14:BCS;COMD         22:ATI;SHR
  7:FM;OBCO          15:SPRT;BGEOM       23:SYS;RING
  8:FM;MTO           16:SPRT;ZNE         24:SYS;PTM

SELECT:__;
```

23:SYS;RING

Index number 23 corresponds to the request voice communication message. This message is identified by the mnemonic SYS;RING. (Refer to paragraph 7-21 for the message format and legal entries.)

24:SYS;PTM

Index number 24 corresponds to the system plain text message. The message is identified by the mnemonic SYS;PTM. (Refer to paragraph 7-17 for the message format and legal entries.)

SELECT:__;

SELECT is used to display or transmit one of the message skeletons. This is a required entry. Legal entries are 1 to 24.

---

g. Exploded View. Not applicable.

5-27. SYSTEM MESSAGE SKELETON SUMMARY MESSAGE (SYS;MSGSUM) (HIP)

a. Purpose. This message is for operator review for selection of message formats for display.

b. Source. The SYS;MSGSUM message is displayed from the SYS;INDEX message.

c. Input. Enter into the SELECT field the index number corresponding to the specific message skeleton you wish to display. Press the EXEC key.

d. Computer Processing. Pressing the EXEC key causes the BCS to generate for display the message skeleton corresponding to the index number entered.

e. Output. The outputs for the SYS;MSGSUM message are as follows:

Index Number Input	Output Message Skeleton
1	FM;CHECK
2	FM;RFAF
3	FM;SUBS
4	FM;INTM
5	FM;QF
6	FM;FOCMD
7	FM;OBCO
8	FM;EOM
9	FM;MTO
10	AFU;BAMOUP
11	AFU;MASK
12	AFU;REG
13	AFU;MV
14	BCS;MVD
15	BCS;COMD
16	SPRT;BGEOM
17	SPRT;ZNE
18	SPRT;LOC
19	NNFP;FC
20	MET;CM
21	HOW;UPDATE
22	HOW;AMOUP
23	HOW;REQUST
24	HOW;MOVE
25	HOW;OBSR
26	ATI;AZR
27	ATI;CDR
28	ATI;SHR
29	SYS;PTM

5-27. SYSTEM MESSAGE SKELETON SUMMARY MESSAGE (SYS;MSGSUM) (HIP) - CONTINUED

f. Message Format and Legal Entries. The following SYS;MSGSUM is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
SYS;MSGSUM;C:___;
  1:FM;CHECK          11:AFU;MASK         21:HOW;UPDATE
  2:FM;RFAF           12:AFU;REG          22:HOW;AMOUP
  3:FM;SUBS           13:AFU;MV           23:HOW;REQUST
  4:FM;INTM           14:BCS;MVD          24:HOW;MOVE
  5:FM;QF             15:BCS;COMD         25:HOW;OBSR
  6:FM;FOCMD          16:SPRT;BGEOM       26:ATI;AZR
  7:FM;OBCO           17:SPRT;ZNE         27:ATI;CDR
  8:FM;EOM            18:SPRT;LOC         28:ATI;SHR
  9:FM;MTO            19:NNFP;FC          29:SYS;PTM
 10:AFU;BAMOUP        20:MET;CM

SELECT:__;
```

SYS;MSGSUM; C:___;

SYS;MSGSUM identifies the message as the system message skeleton summary message.

SYS;MSGSUM; **C:___;**

C indicates the security classification of the message. Legal entries are listed in appendix H.

Default = UN (unclassified)

1:FM;CHECK

Index number 1 corresponds to the check firing command output message. This message is identified by the mnemonic FM;CHECK. (Refer to paragraph 10-66 for the message format and legal entries.)

2:FM;RFAF

Index number 2 corresponds to the fire mission input message. This message is identified by the mnemonic FM;RFAF. (Refer to paragraph 10-54 for the message format and legal entries.)

5-27. SYSTEM MESSAGE SKELETON SUMMARY MESSAGE (SYS;MSGSUM) (HIP) - CONTINUED

3:FM;SUBS

Index number 3 corresponds to the subsequent commands input message. This message is identified by the mnemonic FM;SUBS. (Refer to paragraph 10-63 for the message format and legal entries.)

4:FM;INTM

Index number 4 corresponds to the high burst or mean point of impact fire mission input message. This message is identified by the mnemonic FM;INTM. (Refer to paragraph 10-59 for the message format and legal entries.)

5:FM;QF

Index number 5 corresponds to the quick response fire request input message. This message is identified by the mnemonic FM;QF. (Refer to paragraph 10-58 for the message format and legal entries.)

6:FM;FOCMD

Index number 6 corresponds to the forward observer command message. This message is identified by the mnemonic FM;FOCMD. (Refer to paragraph 10-61 for the message format and legal entries.)

7:FM;OBCO

Index number 7 corresponds to the observer location input message. This message is identified by the mnemonic FM;OBCO. (Refer to paragraph 6-34 for the message format and legal entries.)

8:FM;EOM

Index number 8 corresponds to the end of mission message. This message is identified by the mnemonic FM;EOM. (Refer to paragraph 10-65 for the message format and legal entries.)

5-27. SYSTEM MESSAGE SKELETON SUMMARY MESSAGE (SYS;MSGSUM) (HIP) - CONTINUED

```
SYS;MSGSUM;C:___;
  1:FM;CHECK          11:AFU;MASK         21:HOW;UPDATE
  2:FM;RFAF           12:AFU;REG          22:HOW;AMOUP
  3:FM;SUBS           13:AFU;MV           23:HOW;REQUST
  4:FM;INTM           14:BCS;MVD          24:HOW;MOVE
  5:FM;QF             15:BCS;COMD         25:HOW;OBSR
  6:FM;FOCMD          16:SPRT;BGEOM       26:ATI;AZR
  7:FM;OBCO           17:SPRT;ZNE         27:ATI;CDR
  8:FM;EOM            18:SPRT;LOC         28:ATI;SHR
  9:FM;MTO            19:NNFP;FC          29:SYS;PTM
 10:AFU;BAMOUP        20:MET;CM

SELECT:__;
```

9:FM;MTO

Index number 9 corresponds to the message to observer message. This message is identified by the mnemonic FM;MTO. (Refer to paragraph 10-60 for the message format and legal entries.)

10:AFU;BAMOUP

Index number 10 corresponds to the fire unit ammunition update message. This message is identified by the mnemonic AFU;BAMOUP. (Refer to paragraph 4-18 for the message format and legal entries.)

11:AFU;MASK

Index number 11 corresponds to the fire unit mask input message. This message is identified by the mnemonic AFU;MASK. (Refer to paragraph 6-30 for the message format and legal entries.)

12:AFU;REG

Index number 12 corresponds to the registration data input message. This message is identified by the mnemonic AFU;REG. (Refer to paragraph 6-38 for the message format and legal entries.)

5-27. SYSTEM MESSAGE SKELETON SUMMARY MESSAGE (SYS;MSGSUM) (HIP) - CONTINUED

13:AFU;MV

Index number 13 corresponds to the current muzzle velocity message. This message is identified by the mnemonic AFU;MV. (Refer to paragraph 7-23 for the message format and legal entries.)

14:BCS;MVD

Index number 14 corresponds to the muzzle velocity derivation message. This message is identified by the mnemonic BCS;MVD. (Refer to paragraph 6-33 for the message format and legal entries.)

15:BCS;COMD

Index number 15 corresponds to the command input message. This message is identified by the mnemonic BCS;COMD. (Refer to paragraph 9-13 for the message format and legal entries.)

16:SPRT;BGEOM

Index number 16 corresponds to the support battlefield geometry message. This message is identified by the mnemonic SPRT;BGEOM. (Refer to paragraph 6-35 for the message format and legal entries.)

17:SPRT;ZNE

Index number 17 corresponds to the support zone message. This message is identified by the mnemonic SPRT;ZNE. (Refer to paragraph 6-36 for the message format and legal entries.)

18:SPRT;LOC

Index number 18 corresponds to the support locate message. This message is identified by the mnemonic SPRT;LOC. (Refer to paragraph 6-39 for the message format and legal entries.)

5-27. SYSTEM MESSAGE SKELETON SUMMARY MESSAGE (SYS;MSGSUM) (HIP) - CONTINUED

```
SYS;MSGSUM;C:___;
  1:FM;CHECK          11:AFU;MASK         21:HOW;UPDATE
  2:FM;RFAF           12:AFU;REG          22:HOW;AMOUP
  3:FM;SUBS           13:AFU;MV           23:HOW;REQUST
  4:FM;INTM           14:BCS;MVD          24:HOW;MOVE
  5:FM;QF             15:BCS;COMD         25:HOW;OBSR
  6:FM;FOCMD          16:SPRT;BGEOM       26:ATI;AZR
  7:FM;OBCO           17:SPRT;ZNE         27:ATI;CDR
  8:FM;EOM            18:SPRT;LOC         28:ATI;SHR
  9:FM;MTO            19:NNFP;FC          29:SYS;PTM
 10:AFU;BAMOUP        20:MET;CM

SELECT:__;
```

19:NNFP;FC

Index number 19 corresponds to the nuclear/nonnuclear fire plan message. This message is identified by the mnemonic NNFP;FC. (Refer to paragraph 9-12 for the message format and legal entries.)

20:MET;CM

Index number 20 corresponds to the computer meteorological data message. This message is identified by the mnemonic MET;CM. (Refer to paragraph 6-37 for the message format and legal entries.)

21:HOW;UPDATE

Index number 21 corresponds to the howitzer status update message. This message is identified by the mnemonic HOW;UPDATE. (Refer to paragraph 6-28 for the message format and legal entries.)

22:HOW;AMOUP

Index number 22 corresponds to the howitzer ammunition update message. This message is identified by the mnemonic HOW;AMOUP. (Refer to paragraph 6-29 for the message format and legal entries.)

5-27. SYSTEM MESSAGE SKELETON SUMMARY MESSAGE (SYS;MSGSUM) (HIP) - CONTINUED

23:HOW;REQUST

Index number 23 corresponds to the request for information message. This message is identified by the mnemonic HOW;REQUST. (Refer to paragraph 7-27 for the message format and legal entries.)

24:HOW;MOVE

Index number 24 corresponds to the movement orders message. This message is identified by the mnemonic HOW;MOVE. (Refer to paragraph 7-26 for the message format and legal entries.)

25:HOW;OBSR

Index number 25 corresponds to the howitzer observer message. This message is identified by the mnemonic HOW;OBSR. (Refer to paragraph 3-27 for the message format and legal entries.)

26:ATI;AZR

Index number 26 corresponds to the azimuth distance report message. This message is identified by the mnemonic ATI;AZR. (Refer to paragraph 7-19 for the message format and legal entries.)

27:ATI;CDR

Index number 27 corresponds to the coordinates report message. The message is identified by the mnemonic ATI;CDR. (Refer to paragraph 7-18 for the message format and legal entries.)

28:ATI;SHR

Index number 28 corresponds to the shell report message. The message is identified by the mnemonic ATI;SHR. (Refer to paragraph 7-20 for the message format and legal entries.)

5-27. SYSTEM MESSAGE SUMMARY MESSAGE (SYS;MSGSUM) (HIP) - CONTINUED

```
SYS;MSGSUM;C:___;
  1:FM;CHECK          11:AFU;MASK         21:HOW;UPDATE
  2:FM;RFAF           12:AFU;REG          22:HOW;AMOUP
  3:FM;SUBS           13:AFU;MV           23:HOW;REQUST
  4:FM;INTM           14:BCS;MVD          24:HOW;MOVE
  5:FM;QF             15:BCS;COMD         25:HOW;OBSR
  6:FM;FOCMD          16:SPRT;BGEOM       26:ATI;AZR
  7:FM;OBCO           17:SPRT;ZNE         27:ATI;CDR
  8:FM;EOM            18:SPRT;LOC         28:ATI;SHR
  9:FM;MTO            19:NNFP;FC          29:SYS;PTM
 10:AFU;BAMOUP        20:MET;CM

SELECT:__;
```

29:SYS;PTM

Index number 29 corresponds to the system plain text message. The message is identified by the mnemonic SYS;PTM. (Refer to paragraph 7-17 for the message format and legal entries.)

SELECT:__;

SELECT is used to display or transmit one of the message skeletons. This is a required entry. Legal entries are 1 to 29.

---

g. Exploded View. Not applicable.

5-28. BCS DATA BASE SUMMARY MESSAGE (BCS;DBSUM) (NON-HIP)

a. Purpose. The BCS;DBSUM message is displayed for review or selection of data base information.

b. Source. The BCS;DBSUM message is displayed from the SYS;INDEX message.

c. Input. Enter the index number (1 to 11) corresponding to the data you wish to display into the SELECT field. Press the EXEC key.

d. Computer Processing. Pressing the EXEC key causes the BCS to generate for display the message corresponding to the index number entered in the SELECT field. Pressing the PRINT key causes the BCS to print the message corresponding to the index number entered in the SELECT field if a printer is available.

e. Output. The output depends on the index number entered into the SELECT field.

- When 1 is selected, the SPRT;MAP message is output.
- When 2 is selected, the AFU;UPDATE message is output.
- When 3 is selected, the AFU;BAMOUP message is output.
- When 4 is selected, the BCS;MSKSUM message is output.
- When 5 or 6 is selected, the MET;CM message is output.
- When 7 is selected, the BCS;OBSUM message is output.
- When 8 is selected, the BCS;TKPSUM message is output.
- When 9 is selected, the BCS;GEOSUM message is output.
- When 10 is selected, the BCS;MVVSUM message is output.
- When 11 is selected, the BCS;REGSUM message is output.
- When the SELECT field is blank and the PRINT key is pressed, the BCS;DBSUM message is output.

f. Message Format and Legal Entries. The following BCS;DBSUM message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

5-28. BCS DATA BASE SUMMARY MESSAGE (BCS;DBSUM) (NON-HIP) - CONTINUED

```
BCS;DBSUM;
  1:MAP MOD                          5:MET1
  2:UPDATE/PIECES   __ OF 12         6:MET2
  3:AMMO                             7:OBSERVERS        __ OF  30
      SHELLS        __ OF 26         8:TARGETS/KNPTS   ___ OF 120
      POWDERS        _ OF  9         9:GEOMETRY         __ OF  12
      FUZES         __ OF 26        10:MVV
  4:MASKS           __ OF 24        11:REGISTRATIONS     _ OF   8



SELECT:__;
```

BCS;DBSUM;

BCS;DBSUM identifies the message as the BCS data base summary message.

1:MAP MOD

Index number 1 corresponds to the SPRT;MAP message. (Refer to paragraph 4-15.) If you select index number 1 and press EXEC, a SPRT;MAP message will be displayed showing map modification data. If no map mod data is stored in the data base, a blank SPRT;MAP message will be displayed.

2:UPDATE/PIECES __ OF 12

Index number 2 corresponds to the AFU;UPDATE and BCS;PIECES messages. Enter 2 into the SELECT field and press the EXEC key to display the AFU;UPDATE message. (Refer to paragraph 4-16.) If you have entered data and press the EXEC key, the BCS;PIECES message is displayed. (Refer to paragraph 4-17.) Even if you have entered no data, an AFU;UPDATE or BCS;PIECES message will be displayed. When the AFU;UPDATE message is on display, pressing the NEXT SEG key will also cause the BCS;PIECES message to be displayed. The number in the "__" position is a computer generated entry. It indicates how many of the 12 possible howitzers are stored in the data base.

5-28. BCS DATA BASE SUMMARY MESSAGE (BCS;DBSUM) (NON-HIP) - CONTINUED

```
3:AMMO
    SHELLS        __ OF 26
    POWDERS        _ OF  9
    FUZES         __ OF 26
```

Index number 3 corresponds to the AFU;BAMOUP message. (Refer to paragraph 4-18.) If you select index number 3 and press EXEC, an AFU;BAMOUP message will be displayed showing ammunition data. The numbers in the "__" positions are computer generated entries. They indicate how many of 26 possible shell lots, 9 possible powder lots, and 26 possible fuze types are stored in the data base.

```
4:MASKS          __ OF 24
```

Index number 4 corresponds to the BCS;MSKSUM message. (Refer to paragraph 5-33.) The number in the "__" position is a computer generated entry. It indicates how many of the 24 possible masks are stored in the data base.

```
5:MET1
```

Index number 5 corresponds to the MET;CM message. (Refer to paragraph 6-37.) If you select index number 5, a MET;CM message will be displayed showing the first page of the MET1 message. Use the NEXT SEG or PREV SEG key to page through any other segments of the MET1 message. If no data has been entered into the MET1 message, selecting index number 5 will cause a MET;CM message with standard met to be displayed.

```
6:MET2
```

Selecting index number 6 causes the same processing as selecting index number 5 except that the MET2 message is accessed instead of the MET1 message.

```
7:OBSERVERS      __ OF  30
```

Index number 7 corresponds to the BCS;OBSUM message. (Refer to paragraph 5-34.) The number in the "__" position is a computer generated entry. It indicates how many of the possible 30 observers are stored in the data base.

5-28. BCS DATA BASE SUMMARY MESSAGE (BCS;DBSUM) (NON-HIP) - CONTINUED

```
BCS;DBSUM;
  1:MAP MOD                          5:MET1
  2:UPDATE/PIECES   __ OF 12         6:MET2
  3:AMMO                             7:OBSERVERS       __ OF  30
      SHELLS        __ OF 26         8:TARGETS/KNPTS   ___ OF 120
      POWDERS       _ OF  9          9:GEOMETRY        __ OF  12
      FUZES         __ OF 26        10:MVV
  4:MASKS           __ OF 24        11:REGISTRATIONS    _ OF   8

SELECT:__;
```

8:TARGETS/KNPTS ___ OF 120

Index number 8 corresponds to the BCS;TKPSUM message. (Refer to paragraph 5-35.) The number in the "___" position is a computer generated entry. It indicates how many of the possible 120 targets/known points are stored in the data base. A maximum of 99 known points can be stored due to the size of the KNPT field in the FM;RFAF message.

9:GEOMETRY __ OF 12

Index number 9 corresponds to the BCS;GEOSUM message. (Refer to paragraph 5-36.) The number in the "__" position is a computer generated entry. It indicates how many of the possible 12 FSCM's (up to 10 RFA's, one 3 to 30 point zone, or one 2 to 30 point FLOT) are stored in the data base.

10:MVV

Index number 10 corresponds to the BCS;MVVSUM message. (Refer to paragraph 5-37.)

11:REGISTRATIONS _ OF 8

Index number 11 corresponds to the BCS;REGSUM message. (Refer to paragraph 5-38.) The number in the "_" position is a computer generated entry. It indicates how many of the eight possible registrations are stored in the data base.

5-28. BCS DATA BASE SUMMARY MESSAGE (BCS;DBSUM) (NON-HIP) - CONTINUED

```
SELECT:__;
```

SELECT is used to display one of the options listed above. This is a required entry. Legal entries are 1 to 11.

g. Exploded View. Not applicable.

5-29. BCS DATA BASE SUMMARY MESSAGE (BCS;DBSUM) (HIP)

a. Purpose. The BCS;DBSUM message is displayed for review or for selection of data base information.

b. Source. The BCS;DBSUM message is displayed from the SYS;INDEX message.

c. Input. Enter the index number (1 to 14) corresponding to the data you wish to display into the SELECT field. Press the EXEC key.

d. Computer Processing. Pressing the EXEC key causes the BCS to generate for display the message corresponding to the index number entered in the SELECT field. Pressing the PRINT key causes the BCS to print the message corresponding to the index number entered in the SELECT field if a printer is available.

e. Output. The output depends on the index number entered into the SELECT field.

- When 1 is selected, the SPRT;MAP message is output.
- When 2 is selected, the BCS;HSBSUM message is output.
- When 3 is selected, the AFU;UPDATE message is output.
- When 4 is selected, the BCS;HOWSUM message is output.
- When 5 is selected, the AFU;BAMOUP message is output.
- When 6 is selected, the BCS;HAMSUM message is output.
- When 7 is selected, the BCS;MSKSUM message is output.
- When 8 or 9 is selected, the MET;CM message is output.
- When 10 is selected, the BCS;OBSUM message is output.
- When 11 is selected, the BCS;TKPSUM message is output.
- When 12 is selected, the BCS;GEOSUM message is output.
- When 13 is selected, the BCS;MVVSUM message is output.
- When 14 is selected, the BCS;REGSUM message is output.

f. Message Format and Legal Entries. The following BCS;DBSUM message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

5-29. BCS DATA BASE SUMMARY MESSAGE (BCS;DBSUM) (HIP) - CONTINUED

```
BCS;DBSUM;C:___;

  1:MAP MOD                          8:MET1
  2:HOWITZER SUBSCRIBERS  _ OF  8    9:MET2
  3:PLATOON UPDATE                  10:OBSERVERS          __ OF  30
  4:HOWITZER UPDATE       _ OF  8   11:TARGETS/KNPTS     ___ OF 120
  5:PLATOON AMMO                    12:GEOMETRY           __ OF  12
     SHELLS               __ OF 26  13:MVV
     POWDERS              _  OF  9  14:REGISTRATIONS      _ OF   8
     FUZES                __ OF 26
  6:HOWITZER AMMO         _  OF  8
  7:MASKS                 __ OF 24

SELECT:__;
```

BCS;DBSUM; C:___;

BCS;DBSUM identifies the message as the BCS data base summary message.

BCS;DBSUM; **C:___;**

C indicates the security classification of the message. Legal entries are listed in appendix H.

1:MAP MOD

Index number 1 corresponds to the SPRT;MAP message. (Refer to paragraph 4-15.) If you select index number 1 and press EXEC, a SPRT;MAP message will be displayed showing map modification data. If no map mod data is stored in the data base, a blank SPRT;MAP message will be displayed.

2:HOWITZER SUBSCRIBERS _ OF 8

Index number 2 corresponds to the BCS;HSBSUM messages. (Refer to paragraph 5-30.) If you select index number 2 and press EXEC, a BCS;HSBSUM message will be displayed showing howitzer subscriber information. The number in the "__" position is a computer generated entry. It indicates how many of the eight possible howitzers have subscribers stored in the data base.

5-29. BCS DATA BASE SUMMARY MESSAGE (BCS;DBSUM) (HIP) - CONTINUED

```
3:PLATOON UPDATE
```

Index number 3 corresponds to the AFU;UPDATE message. (Refer to paragraph 4-16.) If you select index number 3 and press EXEC, an AFU;UPDATE message will be displayed showing ammunition and firing unit data for the platoon. A blank AFU;UPDATE message will be displayed if there is no data stored.

```
4:HOWITZER UPDATE          _ OF  8
```

Index number 4 corresponds to the BCS;HOWSUM messages. (Refer to paragraph 5-31.) If you select index number 4 and press EXEC, a BCS;HOWSUM message will be displayed showing the howitzers' ammunition and firing unit data. The number in the "_" position is a computer generated entry. It indicates how many howitzers are stored in the data base.

```
5:PLATOON AMMO
   SHELLS          __ OF 26
   POWDERS          _ OF  9
   FUZES           __ OF 26
```

Index number 3 corresponds to the AFU;BAMOUP message. (Refer to paragraph 4-18.) If you select index number 3 and press EXEC, an AFU;BAMOUP message will be displayed showing ammunition data. The numbers in the "__" positions are computer generated entries. They indicate how many of 26 possible shell lots, 9 possible powder lots, and 26 possible fuze types are stored in the data base.

```
6:HOWITZER AMMO            _ OF  8
```

Index number 6 corresponds to the BCS;HAMSUM message. (Refer to paragraph 5-32.) If you select index number 6 and press EXEC, a BCS;HAMSUM message will be displayed showing howitzer ammunition data. The number in the "_" position is a computer generated entry. It indicates how many of the eight possible howitzers have ammunition in file.

```
7:MASKS                   __ OF 24
```

Index number 7 corresponds to the BCS;MSKSUM message. (Refer to paragraph 5-33.) The number in the "__" position is a computer generated entry. It indicates how many of the 24 possible masks are stored in the data base.

5-29. BCS DATA BASE SUMMARY MESSAGE (BCS;DBSUM) (HIP) - CONTINUED

```
BCS;DBSUM;C:___;

  1:MAP MOD                          8:MET1
  2:HOWITZER SUBSCRIBERS  _ OF  8    9:MET2
  3:PLATOON UPDATE                  10:OBSERVERS          __ OF  30
  4:HOWITZER UPDATE       _ OF  8   11:TARGETS/KNPTS     ___ OF 120
  5:PLATOON AMMO                    12:GEOMETRY           __ OF  12
     SHELLS               __ OF 26  13:MVV
     POWDERS              _ OF  9   14:REGISTRATIONS     _ OF   8
     FUZES                __ OF 26
  6:HOWITZER AMMO         _ OF  8
  7:MASKS                 __ OF 24

SELECT:__;
```

8:MET1

Index number 8 corresponds to the MET;CM message. (Refer to paragraph 6-37.) If you select index number 8, a MET;CM message will be displayed showing the first page of the MET1 message. Use the NEXT SEG or PREV SEG key to page through any other segments of the MET1 message. If no data has been entered into the MET1 message, selecting index number 8 will cause a MET;CM message with standard met to be displayed.

9:MET2

Selecting index number 9 causes the same processing as selecting index number 8 except that the MET2 message is accessed instead of the MET1 message.

10:OBSERVERS __ OF 30

Index number 10 corresponds to the BCS;OBSUM message. (Refer to paragraph 5-34.) The number in the "__" position is a computer generated entry. It indicates how many of the possible 30 observers are stored in the data base.

11:TARGETS/KNPTS ___ OF 120

Index number 11 corresponds to the BCS;TKPSUM message. (Refer to paragraph 5-35.) The number in the "___" position is a computer generated entry. It indicates how many of the possible 120 targets/known points are stored in the data base. A maximum of 99 known points can be stored due to the size of the KNPT field in the FM;RFAF message.

5-29. BCS DATA BASE SUMMARY MESSAGE (BCS;DBSUM) (HIP) - CONTINUED

```
BCS;DBSUM;C:___;

  1:MAP MOD                          8:MET1
  2:HOWITZER SUBSCRIBERS  _ OF  8    9:MET2
  3:PLATOON UPDATE                   10:OBSERVERS        __ OF  30
  4:HOWITZER UPDATE       _ OF  8    11:TARGETS/KNPTS    ___ OF 120
  5:PLATOON AMMO                     12:GEOMETRY         __ OF  12
     SHELL                __ OF 26   13:MVV
     POWDERS              _ OF  9    14:REGISTRATIONS    _ OF   8
     FUZES                __ OF 26
  6:HOWITZER AMMO         _ OF  8
  7:MASKS                 __ OF 24

SELECT:__;
```

12:GEOMETRY __ OF 12

Index number 12 corresponds to the BCS;GEOSUM message. (Refer to paragraph 5-36.) The number in the "__" position is a computer generated entry. It indicates how many of the possible 12 FSCM's (up to 10 RFA's, one 3 to 30 point zone, or one 2 to 30 point FLOT) are stored in the data base.

13:MVV

Index number 13 corresponds to the BCS;MVVSUM message. (Refer to paragraph 5-37.)

14:REGISTRATIONS _ OF 8

Index number 14 corresponds to the BCS;REGSUM message. (Refer to paragraph 5-38.) The number in the "_" position is a computer generated entry. It indicates how many of the eight possible registrations are stored in the data base.

SELECT:__;

SELECT is used to display one of the options listed above. This is a required entry. Legal entries are 1 to 14.

---

g. Exploded View. Not applicable.

5-30. BCS HOWITZER SUBSCRIBER TABLE SUMMARY MESSAGE (BCS;HSBSUM) (HIP)

a. Purpose. The BCS;HSBSUM message is displayed for review or for selection of howitzer subscriber table information for display or printing. A summary of the howitzer subscriber table data for up to eight howitzers is displayed. The BCS can store up to a total of 40 howitzer subscribers with no more than 5 subscribers per howitzer.

b. Source. The BCS;HSBSUM message is displayed from the BCS;DBSUM message.

c. Input. Enter the index number (1 to 8) corresponding to the howitzer you wish to display or print.

d. Computer Processing. Pressing the EXEC key causes the BCS to display a HOW;SBT message. Pressing the PRINT key causes the HOW;SBT message to be printed when a printer is available.

e. Output. The output is as follows:

- a HOW;SBT message
- deletion of subscriber data.

f. Message Format and Legal Entries. The following BCS;HSBSUM message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
BCS;HSBSUM;C:___;
     HOWITZER                    SUBSCRIBERS
  1:_/_/_/__/___;                  _ OF 5
  2:_/_/_/__/___;                  _ OF 5
  3:_/_/_/__/___;                  _ OF 5
  4:_/_/_/__/___;                  _ OF 5
  5:_/_/_/__/___;                  _ OF 5
  6:_/_/_/__/___;                  _ OF 5
  7:_/_/_/__/___;                  _ OF 5
  8:_/_/_/__/___;                  _ OF 5

SELECT:__;
```

BCS;HSBSUM;	C:___;

BCS;HSBSUM identifies the message as the BCS howitzer subscriber table summary message.

5-30. BCS HOWITZER SUBSCRIBER TABLE SUMMARY MESSAGE (BCS;HSBSUM) (HIP) - CONTINUED

BCS;HSBSUM; **C:___;**

C indicates the security classification of the message. Legal entries are listed in appendix H.

Default = ETO

NOTE

The following is a description of line 1 of the BCS;HSBSUM message. The information given also applies to lines 2 through 8.

HOWITZER
1:_/_/_/__/___;

SUBSCRIBERS
_ OF 5

The HOWITZER column displays the logical name of the howitzer as specified in the HOW;SBT message. Values displayed are:

HOWITZER		
1: _/ _/_/__/___;	Section	1 to 4
1:_/ _/ _/__/___;	Platoon	1 to 2
1:_/_/ _/ __/___;	Battery	A thru Z
1:_/_/_/ __/ ___;	Battalion	1 to 99
1:_/_/_/__/ ___;	Regiment	1 to 999

5-30. BCS HOWITZER SUBSCRIBER TABLE SUMMARY MESSAGE (BCS;HSBSUM) (HIP) - CONTINUED

```
BCS;HSBSUM;C:___;
     HOWITZER                    SUBSCRIBERS
  1:_/_/_/__/___;                  _ OF 5
  2:_/_/_/__/___;                  _ OF 5
  3:_/_/_/__/___;                  _ OF 5
  4:_/_/_/__/___;                  _ OF 5
  5:_/_/_/__/___;                  _ OF 5
  6:_/_/_/__/___;                  _ OF 5
  7:_/_/_/__/___;                  _ OF 5
  8:_/_/_/__/___;                  _ OF 5

SELECT:__;
```

```
   HOWITZER
1:_/_/_/__/___;
```

SUBSCRIBERS
_ OF 5

The SUBSCRIBERS column displays the number of subscribers in the HOW;SBT message for that howitzer. Values displayed are 0 through 9.

SELECT:__;

SELECT is used to display the desired index number of the HOW;SBT message to be displayed. This is a required entry. Legal entries are 1 to 8.

---

g. Exploded View. Not applicable.

5-31. BCS HOWITZER SUMMARY MESSAGE (BCS;HOWSUM) (HIP)

a. Purpose. The BCS;HOWSUM message is displayed for review or for selection of howitzer update information for display, deletion, or printing. A summary of the howitzer's status for up to eight howitzers is displayed.

b. Source. The BCS;HSBSUM message is displayed from the BCS;DBSUM message.

c. Input. Enter the index number (1 to 8) corresponding to the howitzer you wish to display, print, or delete.

d. Computer Processing. Pressing the EXEC key causes the BCS to display a HOW;UPDATE message. Pressing the PRINT key causes the HOW;UPDATE message to be printed when a printer is available. Pressing the DELETE key causes the corresponding HOW;UPDATE to be deleted. Pressing the DELETE key also causes an updated BCS;HOWSUM message to be displayed if the howitzer update file is not empty.

e. Output. The output is as follows:

- a HOW;UPDATE message
- deletion of howitzer data.

f. Message Format and Legal Entries. The following HOW;UPDATE message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
BCS;HOWSUM;C:___;
     HOWITZER              CORD              GZ     STATUS
 1:_/_/_/__/___   ______/_______/_____   ___     -
 2:_/_/_/__/___   ______/_______/_____   ___     -
 3:_/_/_/__/___   ______/_______/_____   ___     -
 4:_/_/_/__/___   ______/_______/_____   ___     -
 5:_/_/_/__/___   ______/_______/_____   ___     -
 6:_/_/_/__/___   ______/_______/_____   ___     -
 7:_/_/_/__/___   ______/_______/_____   ___     -
 8:_/_/_/__/___   ______/_______/_____   ___     -

SELECT:__;
```

BCS;HOWSUM;	C:___;

BCS;HOWSUM identifies the message as the BCS howitzer summary message.

5-31. BCS HOWITZER SUMMARY MESSAGE (BCS;HOWSUM) (HIP) - CONTINUED

BCS;HOWSUM; | C:___; |

C indicates the security classification of the message. Legal entries are listed in appendix H.

Default = C

NOTE

The following is a description of line 1 of the BCS;HOWSUM message. The information given also applies to lines 2 through 8.

HOWITZER	CORD	GZ	STATUS
1:_/_/_/__/___	------/--------/-----	---	-

The HOWITZER column displays the logical name of the howitzer as described in the HOW;UPDATE message. Values displayed are:

HOWITZER		
1: | _/ | _/_/__/___	Section	1 to 4
1:_/ | _/ | _/__/___	Platoon	1 to 2
1:_/_/ | _/ | __/___	Battery	A thru Z
1:_/_/_/ | __/ | ___	Battalion	1 to 99
1:_/_/_/__/ | ___ |	Regiment	1 to 999

5-31. BCS HOWITZER SUMMARY MESSAGE (BCS;HOWSUM) (HIP) - CONTINUED

```
BCS;HOWSUM;C:___;
     HOWITZER              CORD              GZ     STATUS
  1:_/_/_/__/___   ______/_______/_____   ___      -
  2:_/_/_/__/___   ______/_______/_____   ___      -
  3:_/_/_/__/___   ______/_______/_____   ___      -
  4:_/_/_/__/___   ______/_______/_____   ___      -
  5:_/_/_/__/___   ______/_______/_____   ___      -
  6:_/_/_/__/___   ______/_______/_____   ___      -
  7:_/_/_/__/___   ______/_______/_____   ___      -
  8:_/_/_/__/___   ______/_______/_____   ___      -

SELECT:__;
```

```
    HOWITZER  |      CORD       |  GZ     STATUS
1:_/_/_/__/___| ______/_______/_____ | ___      -
```

The CORD column displays the grid coordinates of the firing point or the howitzer's center of area of operations. This is a computer generated entry. Values displayed are:

CORD `[ ______/ ]` _____/_____	Easting in meters	0 to 999999
CORD ______/ `[ _____/ ]` _____	Northing in meters	0 to 11000000
CORD ______/_____/ `[ _____ ]`	Altitude in meters	-9999 to +9999

```
    HOWITZER            CORD            |GZ |  STATUS
1:_/_/_/__/___   ______/_______/_____   |___|    -
```

The GZ column displays the howitzer's grid zone. This is a computer generated entry. Values displayed are -60 to +60 (excluding zero).

5-31. BCS HOWITZER SUMMARY MESSAGE (BCS;HOWSUM) (HIP) - CONTINUED

HOWITZER	CORD	GZ	STATUS
1:_/_/_/__/___	------/--------/-----	---	-

The STATUS column displays the status of the howitzer. Legal entries are:

Y - Operational
O - Out of action
M - Moving
S - Stationary
L - Linked
R - Relay linked
Blank - Not given

Default = Y

SELECT:__;

SELECT is used to display the desired index number of the HOW;UPDATE message to be displayed. This is a required entry. Legal entries are 1 to 8.

g. Exploded View. Not applicable.

5-32. BCS HOWITZER AMMUNITION SUMMARY MESSAGE (BCS;HAMSUM) (HIP)

a. Purpose. The BCS;HAMSUM message is displayed for review or for selection of howitzer ammunition data for display, printing, or deletion. The howitzer ammunition data for eight howitzers is displayed. The BCS or each howitzer can store up to 26 shell lots, 9 powder lots, and 26 fuze types.

b. Source. The BCS;HAMSUM message is displayed from the BCS;DBSUM message.

c. Input. Enter the index number (1 to 8) corresponding to the howitzer you wish to display, transmit, print, or delete. Press the appropriate key.

d. Computer Processing. Pressing the EXEC key causes the BCS to generate for review a HOW;AMOUP message. Pressing the PRINT key causes the HOW;AMOUP message to be printed when a printer is available. Pressing the DELETE key causes the corresponding ammunition data to be deleted from the data base and an updated BCS;HAMSUM message to be redisplayed.

e. Output. The output is as follows:

- a HOW;AMOUP message
- deletion of ammunition data.

f. Message Format and Legal Entries. The following BCS;HAMSUM message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
BCS;HAMSUM;C:___;
   HOWITZER          SHELLS      POWDERS     FUZES       DTG
 1: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__
 2: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__
 3: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__
 4: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__
 5: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__
 6: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__
 7: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__
 8: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__

SELECT:__;
```

BCS;HAMSUM;	C:___;

BCS;HAMSUM identifies the message as the BCS howitzer ammunition summary message.

5-32. BCS HOWITZER AMMUNITION SUMMARY MESSAGE (BCS;HAMSUM) (HIP)--CONTINUED

BCS;HAMSUM; C:___;

C indicates the security classification of the message. Legal entries are listed in appendix H.

Default = ETO

NOTE

The following is a description of line 1 of the BCS;HAMSUM message. The information given also applies to lines 2 through 8.

HOWITZER	SHELLS	POWDERS	FUZES	DTG
1: _/_/_/__/___	__ OF 26	_ OF 9	__ OF 26	__/__/__

The HOWITZER column displays the logical name of the howitzer described in the HOW;AMOUP message. Values displayed are:

HOWITZER		
1: _/ _/_/__/___	Section	1 to 4
1: _/ _/ _/__/___	Platoon	1 to 2
1: _/_/ _/ __/___	Battery	A thru Z
1: _/_/_/ __/ ___	Battalion	1 to 99
1: _/_/_/__/ ___	Regiment	1 to 999

HOWITZER	SHELLS	POWDERS	FUZES	DTG
1: _/_/_/__/___	__ OF 26	_ OF 9	__ OF 26	__/__/__

The SHELLS column displays how many of the 26 possible shell lots for the howitzer are entered in the data base. Values displayed are 0 to 26.

5-32. BCS HOWITZER AMMUNITION SUMMARY MESSAGE (BCS;HAMSUM) (HIP) - CONTINUED

```
BCS;HAMSUM;C:___;
    HOWITZER          SHELLS      POWDERS     FUZES       DTG
  1: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__
  2: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__
  3: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__
  4: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__
  5: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__
  6: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__
  7: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__
  8: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__

SELECT:__;
```

```
  HOWITZER          SHELLS      POWDERS     FUZES       DTG
1: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__
```

The POWDERS column displays how many of the 9 possible powder lots for the howitzer are entered in the data base. Values displayed are 0 to 9.

```
  HOWITZER          SHELLS      POWDERS     FUZES       DTG
1: _/_/_/__/___     __ OF 26    _ OF 9      __ OF 26    __/__/__
```

The FUZES column displays how many of the 26 possible fuze types for the howitzer are entered in the data base. Values displayed are 0 to 26.

5-32. BCS HOWITZER AMMUNITION SUMMARY MESSAGE (BCS;HAMSUM) (HIP) - CONTINUED

HOWITZER	SHELLS	POWDERS	FUZES	DTG
1: _/_/_/__/___	__OF 26	_ OF 9	__OF 26	__/__/__

DTG indicates the date and time the last HOW;AMOUP message was received from the howitzer. Values displayed are:

DTG		
__/ __/__	Day	00 to 31
DTG		
__/ __/ __	Hour	00 to 23
DTG		
__/__/ __	Minute	00 to 59

SELECT:__;

SELECT is used to display the desired index number of the HOW;AMOUP message to be displayed. This is a required entry. Legal entries are 1 to 8.

g. Exploded View. Not applicable.

5-33. BCS MASK FILE SUMMARY MESSAGE (BCS;MSKSUM)

a. Purpose. The BCS;MSKSUM message is displayed for review or for selection of mask data for display, transmission, deletion, or printing. The mask data for 12 howitzers is displayed. The BCS can store a total of 24 masks with no more than 8 masks per howitzer.

b. Source. The BCS;MSKSUM message is displayed from the BCS;DBSUM message.

c. Input. Enter the index number (1 to 12) corresponding to the howitzer you wish to display, transmit, print, or delete. Press the appropriate key.

d. Computer Processing. Pressing the EXEC key causes the BCS to generate for display an AFU;MASK message. Pressing the XMIT key causes an AFU;MASK message to be transmitted to the subscriber. Pressing the PRINT key causes an AFU;MASK message to be printed when a printer is available. Pressing the DELETE key causes the selected mask data to be deleted from the data base.

e. Output. The output is as follows:

- an AFU;MASK message when the EXEC key is pressed.
- deletion of selected mask data when the DELETE key is pressed.
- BCS;MSKSUM message when the DELETE, XMIT, or PRINT key is pressed.

f. Message Format and Legal Entries. The following BCS;MSKSUM message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
BCS;MSKSUM;
  1:GUN 1    _ OF 8      7:GUN  7    _ OF 8
  2:GUN 2    _ OF 8      8:GUN  8    _ OF 8
  3:GUN 3    _ OF 8      9:GUN  9    _ OF 8
  4:GUN 4    _ OF 8     10:GUN 10    _ OF 8
  5:GUN 5    _ OF 8     11:GUN 11    _ OF 8
  6:GUN 6    _ OF 8     12:GUN 12    _ OF 8



SELECT:__;
```

BCS;MSKSUM;

BCS;MSKSUM identifies the message as the BCS mask file summary message.

5-33. BCS MASK FILE SUMMARY MESSAGE (BCS;MSKSUM) - CONTINUED

NOTE

The following is a description of line 1 of the BCS;MSKSUM message. The information given also applies to lines 2 through 12.

| 1: | GUN 1 _ OF 8

This field indicates the index number for the howitzer on that line. Enter this number into the SELECT field to display the information for the howitzer. Index numbers are 1 through 12.

1: | GUN 1 | _ OF 8

GUN 1 indicates the howitzer that corresponds to the mask data that is displayed.

1:GUN 1 | _ OF 8 |

This field is used to indicate how many of eight possible masks for the howitzer are stored in the data base. The number in the "_" position is a computer generated entry.

| SELECT:__; |

SELECT is used to display, transmit, print, or delete one of the options listed above. This is a required entry. Legal entries are 1 to 12.

g. Exploded View. Not applicable.

5-34. BCS OBSERVER SUMMARY MESSAGE (BCS;OBSUM)

a. Purpose. The BCS;OBSUM message is displayed for review or for selection of observer data for display, transmission, deletion, or printing. The data base can store a maximum of 30 observers and their locations.

b. Source. The BCS;OBSUM message is displayed from the BCS;DBSUM message.

c. Input. If the observer information you wish to display is not on the screen, press NEXT SEG key. Enter the index number (1 to 10) corresponding to the observer data you wish to display, transmit, print, or delete into the SELECT field. Press the appropriate key.

d. Computer Processing. Pressing the EXEC key causes the BCS to generate for display an FM;OBCO message. Pressing the XMIT key causes the BCS to transmit an FM;OBCO message to any subscriber other than a howitzer. Pressing the PRINT key causes the BCS to print an FM;OBCO message if a printer is available. Pressing the DELETE key causes the selected observer data to be deleted from the data base.

e. Output. The output is as follows:

- an FM;OBCO message when the EXEC key is pressed.
- deletion of selected observer data when the DELETE key is pressed.
- BCS;OBSUM message when the DELETE, XMIT, or PRINT key is pressed.

f. Message Format and Legal Entries. The following BCS;OBSUM message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
BCS;OBSUM; OB          CORD                GLLDCO    CLDHT     VISIB
        1: __  ______/________/_____        ___       ___       __
        2: __  ______/________/_____        ___       ___       __
        3: __  ______/________/_____        ___       ___       __
        4: __  ______/________/_____        ___       ___       __
        5: __  ______/________/_____        ___       ___       __
        6: __  ______/________/_____        ___       ___       __
        7: __  ______/________/_____        ___       ___       __
        8: __  ______/________/_____        ___       ___       __
        9: __  ______/________/_____        ___       ___       __
       10: __  ______/________/_____        ___       ___       __
SELECT:__;
```

BCS;OBSUM;

BCS;OBSUM indicates that the message is the BCS observer summary message.

5-34. BCS OBSERVER SUMMARY MESSAGE (BCS;OBSUM) - CONTINUED

NOTE

The following is a description of line 1 of the BCS;OBSUM message. The information given also applies to lines 2 through 10.

```
BCS;OBSUM;   OB          CORD            GLLDCO    CLDHT    VISIB
      | 1: | --  ------/--------/-----    ---       ---      --
```

The number in this field indicates the index number for the observer on that line. Since each segment of the message can display only 10 observers, 3 segments are needed to hold all 30 observers. If the observer data you wish to display, transmit, delete, or print is not on the segment displayed, press the NEXT SEG key or PREV SEG key to display the correct segment. Each segment of the message displays index numbers 1 through 10.

```
BCS;OBSUM;  | OB |      CORD            GLLDCO    CLDHT    VISIB
      1:    | -- |  ------/--------/-----  ---       ---      --
```

OB indicates the observer's identifying number. This is a computer generated entry. Values displayed are 0 to 99.

```
BCS;OBSUM; OB |        CORD          | GLLDCO    CLDHT    VISIB
      1:   -- | ------/--------/----- |  ---       ---      --
```

CORD indicates the observer's coordinates. This is a computer generated entry. Values displayed are:

```
          CORD
| ------/ | --------/-----     Easting in meters      0 to 999999

            CORD
------/ | --------/ | -----     Northing in meters     0 to 11000000

          CORD
------/--------/ | ----- |      Altitude in meters     -9999 to +9999
```

5-34. BCS OBSERVER SUMMARY MESSAGE (BCS;OBSUM) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
BCS;OBSUM; OB          CORD              GLLDCO    CLDHT    VISIB
        1: __  ______/_______/_____       ---       ---      --
        2: __  ______/_______/_____       ---       ---      --
        3: __  ______/_______/_____       ---       ---      --
        4: __  ______/_______/_____       ---       ---      --
        5: __  ______/_______/_____       ---       ---      --
        6: __  ______/_______/_____       ---       ---      --
        7: __  ______/_______/_____       ---       ---      --
        8: __  ______/_______/_____       ---       ---      --
        9: __  ______/_______/_____       ---       ---      --
       10: __  ______/_______/_____       ---       ---      --
SELECT:__;
```

```
BCS;OBSUM; OB          CORD            | GLLDCO |  CLDHT    VISIB
        1: __  ______/_______/_____    |  ---   |   ---      --
```

GLLDCO indicates the observer's laser code for Copperhead missions. This is a computer generated entry. Values displayed are 111 to 888.

```
BCS;OBSUM; OB          CORD              GLLDCO  | CLDHT |  VISIB
        1: __  ______/_______/_____       ---    |  ---  |    --
```

CLDHT indicates the cloud height in tens of meters to be used in Copperhead missions. This is a computer generated entry. Values displayed are 0 to 999.

```
BCS;OBSUM; OB          CORD              GLLDCO    CLDHT   | VISIB |
        1: __  ______/_______/_____       ---       ---    |  --   |
```

VISIB indicates the visibility code used for Copperhead missions. This is a computer generated entry. Values displayed are 3, 5, or 10.

```
| SELECT:__; |
```

SELECT is used to display information about observers. This is a required entry. Legal entries are 1 to 10.

---

g. Exploded View. Not applicable.

5-35. BCS TARGET/KNOWN POINT SUMMARY MESSAGE (BCS;TKPSUM)

a. Purpose. The BCS;TKPSUM message is displayed for review or for selection of target/known point data for display, transmission, deletion, or printing. The data base can store a maximum of 120 targets and/or known points. A maximum of 99 known points can be stored due to the size of the KNPT field of the FM;RFAF message.

b. Source. The BCS;TKPSUM message is displayed from the BCS;DBSUM message.

c. Input. Enter the index number (1 to 10) corresponding to the target or known point data you wish to display, transmit, print, or delete into the SELECT field. Press the appropriate key.

d. Computer Processing. Pressing the EXEC key causes the BCS to generate for display an FM;RFAF message. Pressing the XMIT key causes the BCS to transmit an FM;RFAF message to the subscriber. If the weapon model loaded is HIP and the subscriber is a howitzer, you cannot transmit the FM;RFAF message. Refer to paragraph 6-20 for the procedure. Pressing the PRINT key causes the BCS to print an FM;RFAF message if a printer is available. Pressing the DELETE key causes the selected target/known point data to be deleted from the data base.

e. Output. The output is as follows:

- an FM;RFAF message when the EXEC key is pressed.
- selected target/known point data is deleted when the DELETE key is pressed.
- BCS;TKPSUM message when the XMIT, DELETE, or PRINT key is pressed.

f. Message Format and Legal Entries. The following BCS;TKPSUM message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
BCS;TKPSUM; TGT      KNPT          CORD            GZ
        1:______     --     ______/________/_____   ---
        2:______     --     ______/________/_____   ---
        3:______     --     ______/________/_____   ---
        4:______     --     ______/________/_____   ---
        5:______     --     ______/________/_____   ---
        6:______     --     ______/________/_____   ---
        7:______     --     ______/________/_____   ---
        8:______     --     ______/________/_____   ---
        9:______     --     ______/________/_____   ---
       10:______     --     ______/________/_____   ---
SELECT:__;
```

5-35. BCS TARGET/KNOWN POINT SUMMARY MESSAGE (BCS;TKPSUM) - CONTINUED

BCS;TKPSUM;

BCS;TKPSUM indicates that the message is the BCS target/known point summary message.

NOTE

The following is a description of line 1 of the BCS;TKPSUM message. The information given also applies to lines 2 through 10.

```
BCS;TKPSUM;    TGT      KNPT          CORD            GZ
      | 1: |  ------     --     ------/--------/-----   ---
```

The number in this field indicates the index number for the target or known point on that line. Since each segment of this message can display only 10 targets and/or known points, 12 segments are needed to hold all targets and/or known points. If the target or known point you wish to display, transmit, print, or delete is not on the segment displayed, press the NEXT SEG or PREV SEG key until you come to the right segment. Each segment of the message displays index numbers 1 through 10.

```
BCS;TKPSUM;  | TGT |   KNPT          CORD            GZ
      1:     | ------|   --     ------/--------/-----   ---
```

TGT indicates the target number assigned to each target or known point. This is a computer generated entry. Values displayed are two letters followed by four numbers.

```
BCS;TKPSUM; TGT     | KNPT |        CORD            GZ
      1:------      |  --  | ------/--------/-----   ---
```

KNPT indicates the number assigned to each known point. An entry indicates a known point instead of a target. This is a computer generated entry. Values displayed are 00 to 99.

5-35. BCS TARGET/KNOWN POINT SUMMARY MESSAGE (BCS;TKPSUM) - CONTINUED

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
BCS;TKPSUM; TGT      KNPT          CORD          GZ
        1:______     --     ______/_______/_____  ---
        2:______     --     ______/_______/_____  ---
        3:______     --     ______/_______/_____  ---
        4:______     --     ______/_______/_____  ---
        5:______     --     ______/_______/_____  ---
        6:______     --     ______/_______/_____  ---
        7:______     --     ______/_______/_____  ---
        8:______     --     ______/_______/_____  ---
        9:______     --     ______/_______/_____  ---
       10:______     --     ______/_______/_____  ---
SELECT:__;
```

```
BCS;TKPSUM; TGT      KNPT  |      CORD      |  GZ
        1:______     --    | ______/_______/_____ |  ---
```

CORD indicates the coordinates of the target or known point. This is a computer generated entry. Values displayed are:

CORD: `______/` `_______/_____`	Easting in meters	0 to 999999
`______/` CORD: `_______/` `_____`	Northing in meters	0 to 11000000
`______/_______/` CORD: `_____`	Altitude in meters	-9999 to +9999

```
BCS;TKPSUM; TGT      KNPT          CORD          | GZ  |
        1:______     --     ______/_______/_____ | ___ |
```

GZ indicates the grid zone of the target or known point coordinates. This is a computer generated entry. Values displayed are -60 to +60 (excluding zero).

```
| SELECT:__; |
```

SELECT is used to display information about targets or known points. This is a required entry. Legal entries are 1 to 10.

---

g. Exploded View. Not applicable.

5-36. BCS GEOMETRY SUMMARY MESSAGE (BCS;GEOSUM)

a. Purpose. The BCS;GEOSUM message is displayed for review or for selection of Fire Support Coordination Measures (FSCM's) data for display, transmission, deletion, or printing. The data base can store a maximum of 12 FSCM's (up to 10 RFA's, one 3 to 30 point zone, or one 2 to 30 point FLOT).

b. Source. The BCS;GEOSUM message is displayed from the BCS;DBSUM message.

c. Input. Enter the index number (1 to 12) corresponding to the FSCM data you wish to display, transmit, print, or delete into the SELECT field. Press the appropriate key.

d. Computer Processing. Pressing the EXEC key causes the BCS to generate for display either a SPRT;BGEOM or a SPRT;ZNE message. Pressing the XMIT key causes the BCS to transmit a SPRT;BGEOM or SPRT;ZNE message to any subscriber other than a howitzer. Pressing the PRINT key causes the BCS to print a message if a printer is available. Pressing the DELETE key causes the selected FLOT, RFA, or zone data to be deleted from the data base.

e. Output. The output is as follows:

- a SPRT;BGEOM or SPRT;ZNE message when the EXEC key is pressed.
- selected FLOT, RFA, or zone data is deleted when the DELETE key is pressed.
- BCS;GEOSUM message when the XMIT, DELETE, or PRINT key is pressed.

f. Message Format and Legal Entries. The following BCS;GEOSUM message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
BCS;GEOSUM;
    TYPE   NAME     EFFECTIVE TIME        TYPE   NAME     EFFECTIVE TIME
 1:____  ______  __/__/__,__/__/__    7:____  ______  __/__/__,__/__/__
 2:____  ______  __/__/__,__/__/__    8:____  ______  __/__/__,__/__/__
 3:____  ______  __/__/__,__/__/__    9:____  ______  __/__/__,__/__/__
 4:____  ______  __/__/__,__/__/__   10:____  ______  __/__/__,__/__/__
 5:____  ______  __/__/__,__/__/__   11:____  ______  __/__/__,__/__/__
 6:____  ______  __/__/__,__/__/__   12:____  ______  __/__/__,__/__/__

SELECT:__;
```

BCS;GEOSUM;

BCS;GEOSUM indicates the message is the BCS geometry summary message.

5-36. BCS GEOMETRY SUMMARY MESSAGE (BCS;GEOSUM) - CONTINUED

NOTE

The following is a description of line 1 of the BCS;GEOSUM message. The information given also applies to lines 2 through 12.

```
      TYPE   NAME    EFFECTIVE TIME
| 1: | ----  ------  __/__/__,__/__/__
```

This field indicates the index number for the individual geometry data contained in a SPRT;BGEOM or SPRT;ZNE message.

```
      | TYPE |  NAME    EFFECTIVE TIME
1:    | ---- |  ------  __/__/__,__/__/__
```

TYPE indicates that the geometry data is a FLOT, RFA, or zone. FLOT's and RFA's will be displayed in a SPRT;BGEOM message. Zones will be displayed in a SPRT;ZNE message. This is a computer generated entry. Values displayed are FLOT, RFA, or ZONE.

```
      TYPE | NAME |   EFFECTIVE TIME
1:    ---- | ------ | __/__/__,__/__/__
```

NAME indicates the name of the FLOT, RFA, or zone. This is a computer generated entry. Values displayed are six alphanumeric characters.

5-36. BCS GEOMETRY SUMMARY MESSAGE (BCS;GEOSUM) - CONTINUED

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
BCS;GEOSUM;
    TYPE   NAME     EFFECTIVE TIME        TYPE   NAME     EFFECTIVE TIME
 1:____ ______ __/__/__,__/__/__    7:____ ______ __/__/__,__/__/__
 2:____ ______ __/__/__,__/__/__    8:____ ______ __/__/__,__/__/__
 3:____ ______ __/__/__,__/__/__    9:____ ______ __/__/__,__/__/__
 4:____ ______ __/__/__,__/__/__   10:____ ______ __/__/__,__/__/__
 5:____ ______ __/__/__,__/__/__   11:____ ______ __/__/__,__/__/__
 6:____ ______ __/__/__,__/__/__   12:____ ______ __/__/__,__/__/__

SELECT:__;
```

```
    TYPE  NAME   | EFFECTIVE TIME |
 1: ____ ______  | __/__/__,__/__/__ |
```

This field indicates the timeframe for which a particular geometry is in effect. There are two iterations of time. This is a computer generated entry. Values displayed are:

|__/| __/__,	Day	1 to 31
__/ |__/| __,	Hour	00 to 23
__/__/ |__,|	Minute	00 to 59

```
| SELECT:__; |
```

SELECT is used to display specific geometry data. This is a required entry. Legal entries are 1 to 12.

---

g. Exploded View. Not applicable.

5-37. BCS MUZZLE VELOCITY VARIATION SUMMARY MESSAGE (BCS;MVVSUM)

a. Purpose. The BCS;MVVSUM message is displayed for review or for selection of Muzzle Velocity Variation (MVV) data for display, deletion, or printing.

b. Source. The BCS;MVVSUM message is displayed from the BCS;DBSUM message.

c. Input. Enter the index number (1 to 12) corresponding to the MVV data you wish to display, print, or delete into the SELECT field. Press the appropriate key.

d. Computer Processing. Pressing the EXEC key causes the BCS to generate for display a BCS;MVV message. Pressing the PRINT key causes the BCS to print a BCS;MVV message if a printer is available. Pressing the DELETE key causes the selected MVV data to be deleted from the data base.

e. Output. The output is as follows:

- a BCS;MVV message when the EXEC key is pressed.
- selected MVV data is deleted when the DELETE key is pressed. (When MVV data is deleted, the defaults are entered.)
- BCS;MVVSUM message when the DELETE or PRINT key is pressed.

f. Message Format and Legal Entries. The following BCS;MVVSUM message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
BCS;MVVSUM;
  1:GUN 1      __ OF __        7:GUN  7      __ OF __
  2:GUN 2      __ OF __        8:GUN  8      __ OF __
  3:GUN 3      __ OF __        9:GUN  9      __ OF __
  4:GUN 4      __ OF __       10:GUN  10     __ OF __
  5:GUN 5      __ OF __       11:GUN  11     __ OF __
  6:GUN 6      __ OF __       12:GUN  12     __ OF __


SELECT:__;
```

BCS;MVVSUM;

BCS;MVVSUM indicates the message is the BCS muzzle velocity variation summary message.

5-37. BCS MUZZLE VELOCITY VARIATION SUMMARY MESSAGE (BCS;MVVSUM) - CONTINUED

```
BCS;MVVSUM;
  1:GUN 1     __ OF __      7:GUN  7     __ OF __
  2:GUN 2     __ OF __      8:GUN  8     __ OF __
  3:GUN 3     __ OF __      9:GUN  9     __ OF __
  4:GUN 4     __ OF __     10:GUN 10     __ OF __
  5:GUN 5     __ OF __     11:GUN 11     __ OF __
  6:GUN 6     __ OF __     12:GUN 12     __ OF __

SELECT:__;
```

NOTE

The following is a description of line 1 of the BCS;MVVSUM message. The information given also applies to lines 2 through 12.

1:	GUN 1 __ OF __

This field indicates the index number for the howitzer on that line. Enter this number into the SELECT field to display the information for the howitzer. Index numbers are 1 through 12.

1: | GUN 1 | __ OF __

GUN 1 indicates the howitzer that corresponds to the MVV data that is displayed.

1:GUN 1 | __ OF __ |

This field is used to indicate how many of the possible MVV's for the howitzer are stored in the data base. The numbers in the "__" positions are computer generated. The number in the second "__" position is based on the weapon model loaded.

SELECT:__;

SELECT is used to display information about muzzle velocity variations. This is a required entry. Legal entries are 1 to 12.

---

g. Exploded View. Not applicable.

5-38. BCS REGISTRATION SUMMARY MESSAGE (BCS;REGSUM)

a. Purpose. The BCS;REGSUM message is displayed for review or for selection of registration correction data for display, transmission, deletion, or printing.

b. Source. The BCS;REGSUM message is displayed from the BCS;DBSUM message.

c. Input. Enter the index number (1 to 8) corresponding to the registration correction data you wish to display, transmit, print, or delete into the SELECT field. Press the appropriate key.

d. Computer Processing. Pressing the EXEC key causes the BCS to generate for display an AFU;REG message. Pressing the XMIT key causes the BCS to transmit an AFU;REG message to the subscriber. Pressing the PRINT key causes the BCS to print an AFU;REG message if a printer is available. Pressing the DELETE key causes the selected registration correction data to be deleted from the data base.

e. Output. The output is as follows:

- an AFU;REG message when the EXEC key is pressed.
- selected registration correction data is deleted when the DELETE key is pressed.
- BCS;REGSUM message when the DELETE, XMIT, or PRINT key is pressed.

f. Message Format and Legal Entries. The following BCS;REGSUM message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
BCS;REGSUM;     SHL     LOT      CHG     ANGLE      TGT
          1:    ___     _/_       -      ____      ______
          2:    ___     _/_       -      ____      ______
          3:    ___     _/_       -      ____      ______
          4:    ___     _/_       -      ____      ______
          5:    ___     _/_       -      ____      ______
          6:    ___     _/_       -      ____      ______
          7:    ___     _/_       -      ____      ______
          8:    ___     _/_       -      ____      ______

SELECT:__;
```

BCS;REGSUM;

BCS;REGSUM indicates the message is the BCS registration summary message.

5-38. BCS REGISTRATION SUMMARY MESSAGE (BCS;REGSUM) - CONTINUED

NOTE

The following is a description of line 1 of the BCS;REGSUM message. The information given also applies to lines 2 through 8.

```
BCS;REGSUM;    SHL    LOT      CHG    ANGLE     TGT
     |1:|      ---    _/_      -      ----      ------
```

This field indicates the index number for the registration correction on that line. Index numbers are 1 through 8.

```
BCS;REGSUM;  |SHL|    LOT      CHG    ANGLE     TGT
       1:    |___|    _/_      -      ----      ------
```

SHL indicates the registering shell type. This is a computer generated entry. Values displayed are listed in appendix G.

```
BCS;REGSUM;    SHL   |LOT|     CHG    ANGLE     TGT
       1:      ---   |_/_|     -      ----      ------
```

LOT indicates the shell and powder lot. This is a computer generated entry. Values displayed are:

LOT		
|_/| _	Shell lot	One alphabetic character
_/ |_|	Powder lot	One alphabetic character

5-38. BCS REGISTRATION SUMMARY MESSAGE (BCS;REGSUM) - CONTINUED

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
BCS;REGSUM;     SHL     LOT      CHG     ANGLE      TGT
        1:      ---     _/_      -       ----       ------
        2:      ---     _/_      -       ----       ------
        3:      ---     _/_      -       ----       ------
        4:      ---     _/_      -       ----       ------
        5:      ---     _/_      -       ----       ------
        6:      ---     _/_      -       ----       ------
        7:      ---     _/_      -       ----       ------
        8:      ---     _/_      -       ----       ------

SELECT:__;
```

```
BCS;REGSUM;     SHL     LOT     | CHG |   ANGLE      TGT
        1:      ---     _/_     |  -  |   ----       ------
                                |_____|
```

CHG indicates the charge number. This is a computer generated entry. Values displayed are 1 to 9.

```
BCS;REGSUM;     SHL     LOT      CHG    | ANGLE |    TGT
        1:      ---     _/_      -      | ----  |    ------
                                        |_______|
```

ANGLE indicates the angle of fire. This is a computer generated entry. Values displayed are:

HIGH - High angle of fire
LOW - Low angle of fire

```
BCS;REGSUM;     SHL     LOT      CHG     ANGLE   | TGT    |
        1:      ---     _/_      -       ----    | ------ |
                                                 |________|
```

TGT indicates the number of the target fired on during the registration mission which resulted in the registration corrections displayed. When an AFU;REG message is transmitted, the target number is not transmitted because it follows the EOT symbol. The target number will not be displayed if it is not entered in the AFU;REG message. This is a computer generated entry. Values displayed are two letters followed by four numbers.

5-38. BCS REGISTRATION SUMMARY MESSAGE (BCS;REGSUM) - CONTINUED

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
BCS;REGSUM;     SHL     LOT       CHG     ANGLE      TGT
          1:    ___     _/_       -       ----       ------
          2:    ___     _/_       -       ----       ------
          3:    ___     _/_       -       ----       ------
          4:    ___     _/_       -       ----       ------
          5:    ___     _/_       -       ----       ------
          6:    ___     _/_       -       ----       ------
          7:    ___     _/_       -       ----       ------
          8:    ___     _/_       -       ----       ------

SELECT:__;
```

SELECT:__;

SELECT is used to display registration correction data. This is a required entry. Legal entries are 1 to 8.

---

g. Exploded View. Not applicable.

5-39. BCS FIRE PLAN SUMMARY MESSAGE (BCS;FPSUM)

a. Purpose. The BCS;FPSUM message is used to display a summary of up to four fire plans stored in the data base. You use the BCS;FPSUM message to select a fire plan for review.

b. Source. The BCS;FPSUM message is displayed from the SYS;INDEX message.

c. Input. Enter the index number (1 to 4) corresponding to the fire plan you wish to display or print into the SELECT field. Press the appropriate key.

d. Computer Processing. Pressing the EXEC key causes the BCS to generate for display a BCS;FPTSUM message.

e. Output. The output is a BCS;FPTSUM message.

f. Message Format and Legal Entries. The following BCS;FPSUM message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

BCS;FPSUM;

	PLAN	TARGETS	HHOUR
1:	------	--	--/--
2:	------	--	--/--
3:	------	--	--/--
4:	------	--	--/--

SELECT:__;

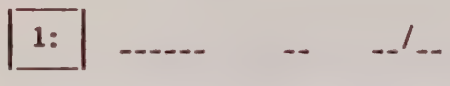
BCS;FPSUM;

BCS;FPSUM indicates the message is the BCS fire plan summary message.

NOTE

The following is a description of line 1 of the BCS;FPSUM message. The information given also applies to lines 2 through 4.

5-39. BCS FIRE PLAN SUMMARY MESSAGE (BCS;FPSUM) - CONTINUED

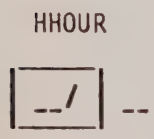


This field indicates the index number for the fire plan on that line. Index numbers are 1 through 4.

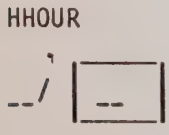
PLAN indicates the name of each fire plan. This is a computer generated entry. Plan names displayed may contain up to six alphanumeric characters.

TARGETS indicates the number of targets assigned to each fire plan. The maximum number of targets that can be stored in the data base is 78. Any number of targets may be associated with an individual fire plan as long as the total number for all fire plans does not exceed 78. This is a computer generated entry. Values displayed are 0 to 78.

HHOUR indicates the H-hour for each plan. A blank in this field indicates that the fire plan is "on call". An entry of all zeros indicates the plan is to be fired at midnight. This is a computer generated entry. Values displayed are:



Hour 00 to 23



Minutes 00 to 59

5-39. BCS FIRE PLAN SUMMARY MESSAGE (BCS;FPSUM) - CONTINUED

BCS;FPSUM;

	PLAN	TARGETS	HHOUR
1:	______	--	--/--
2:	______	--	--/--
3:	______	--	--/--
4:	______	--	--/--

SELECT:__;

SELECT:__;

SELECT is used to display the BCS;FPTSUM message for the fire plan you wish to review. This is a required entry. Legal entries are 1 to 4.

---

g. Exploded View. Not applicable.

5-40. BCS FIRE PLAN TARGET SUMMARY MESSAGE (BCS;FPTSUM)

a. Purpose. The BCS;FPTSUM message is displayed for review or for selection of fire plan targets for display, transmission, printing, or deletion. The data base can store a maximum of 78 targets. Any number of targets may be associated with an individual fire plan as long as the total number of targets does not exceed 78.

b. Source. The BCS;FPTSUM message is displayed from the BCS;FPSUM message.

c. Input. If the target you wish to display is not on the screen, press NEXT SEG key. Enter the index number (1 to 10) corresponding to the target you wish to display, transmit, print, or delete into the SELECT field. Press the appropriate key.

d. Computer Processing. Pressing the EXEC key causes the BCS to generate for display an NNFP;FC message. Pressing the XMIT key causes the BCS to transmit an NNFP;FC message to any subscriber other than a howitzer. Pressing the PRINT key causes the BCS to print an NNFP;FC message if a printer is available. Pressing the DELETE key causes the selected fire plan target data to be deleted from the data base.

e. Output. The output is as follows:

- an NNFP;FC message when the EXEC key is pressed.
- selected fire plan target data is deleted when the DELETE key is pressed.
- BCS;FPTSUM message when the DELETE, XMIT, or PRINT key is pressed.

f. Message Format and Legal Entries. The following BCS;FPTSUM message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
BCS;FPTSUM;      PLAN      TGT       H      RNDS       SHEF       PTF
          1:    ------    ------    ----   __/__    ____/____    ----
          2:    ------    ------    ----   __/__    ____/____    ----
          3:    ------    ------    ----   __/__    ____/____    ----
          4:    ------    ------    ----   __/__    ____/____    ----
          5:    ------    ------    ----   __/__    ____/____    ----
          6:    ------    ------    ----   __/__    ____/____    ----
          7:    ------    ------    ----   __/__    ____/____    ----
          8:    ------    ------    ----   __/__    ____/____    ----
          9:    ------    ------    ----   __/__    ____/____    ----
         10:    ------    ------    ----   __/__    ____/____    ----
SELECT:__;
```

5-40. BCS FIRE PLAN TARGET SUMMARY MESSAGE (BCS;FPTSUM) - CONTINUED

BCS;FPTSUM;

BCS;FPTSUM indicates the message is the BCS fire plan target summary message.

NOTE

The following is a description of line 1 of the BCS;FPTSUM message. The information given also applies to lines 2 through 10.

```
BCS;FPTSUM;     PLAN      TGT       H      RNDS       SHEF       PTF
      1:        ------    ------    ----   --/--      ----/----  ----
```

1:

This field indicates the index number for the target on that line. Each segment of the message displays index numbers 1 through 10. If the target you wish to display, transmit, print, or delete is not on the displayed segment, press the NEXT SEG or PREV SEG key to display the correct segment.

```
BCS;FPTSUM;     PLAN      TGT       H      RNDS       SHEF       PTF
      1:        ------    ------    ----   --/--      ----/----  ----
```

PLAN

PLAN indicates the plan name. This is a computer generated entry. Values displayed are a maximum of six alphanumeric characters.

```
BCS;FPTSUM;     PLAN      TGT       H      RNDS       SHEF       PTF
      1:        ------    ------    ----   --/--      ----/----  ----
```

TGT

TGT indicates the target number. This is a computer generated entry. Values displayed are two letters followed by four numbers.

```
BCS;FPTSUM;     PLAN      TGT       H      RNDS       SHEF       PTF
      1:        ------    ------    ----   --/--      ----/----  ----
```

H

H indicates the time the target is to be fired in minutes relative to H-hour. This is a computer generated entry. Values displayed are -999 to +999. When this field is blank, the target is "on call".

5-40. BCS FIRE PLAN TARGET SUMMARY MESSAGE (BCS;FPTSUM) - CONTINUED

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
BCS;FPTSUM;     PLAN      TGT       H       RNDS        SHEF        PTF
        1:      ------    ------    ----    __/__       ____/____   ----
        2:      ------    ------    ----    __/__       ____/____   ----
        3:      ------    ------    ----    __/__       ____/____   ----
        4:      ------    ------    ----    __/__       ____/____   ----
        5:      ------    ------    ----    __/__       ____/____   ----
        6:      ------    ------    ----    __/__       ____/____   ----
        7:      ------    ------    ----    __/__       ____/____   ----
        8:      ------    ------    ----    __/__       ____/____   ----
        9:      ------    ------    ----    __/__       ____/____   ----
       10:      ------    ------    ----    __/__       ____/____   ----
SELECT:__;
```

```
BCS;FPTSUM;     PLAN      TGT       H       RNDS        SHEF        PTF
        1:      ------    ------    ----    __/__       ____/____   ----
```

RNDS indicates rounds to fire in effect. This is a computer generated entry. Values displayed are:

RNDS `__/__` --	Initial volley	0 to 99
RNDS --/ `__`	Subsequent volleys	0 to 99

```
BCS;FPTSUM;     PLAN      TGT       H       RNDS        SHEF        PTF
        1:      ------    ------    ----    __/__       ____/____   ----
```

SHEF indicates the type of projectile used in effect. This is a computer generated entry. Values displayed are listed in appendix G.

SHEF `____/` ----	Initial volley
SHEF ----/ `____`	Subsequent volleys

5-40. BCS FIRE PLAN TARGET SUMMARY MESSAGE (BCS;FPTSUM) - CONTINUED

BCS;FPTSUM; 1:	PLAN	TGT	H	RNDS	SHEF	PTF
	------	------	----	--/--	----/----	----

PTF indicates howitzers to fire. This is a computer generated entry. Values displayed are listed in appendix F.

SELECT:__;

SELECT is used to display the NNFP;FC message for the target you wish to review. This is a required entry. Legal entries are 1 to 10.

g. Exploded View. Not applicable.

5-41. SYSTEM WARNINGS SUMMARY MESSAGE (SYS;WARNS)

a. Purpose. The SYS;WARNS message is displayed for operator review of up to 12 system warning messages.

b. Source. The SYS;WARNS message is displayed from the SYS;INDEX message.

c. Input. Not applicable.

d. Computer Processing. When more than 12 system warnings are generated, the BCS automatically deletes the first warning. The remaining 11 warnings move up, and the newest warning is placed at the bottom. If you press the DELETE key, all system warnings on display are deleted.

e. Output. SYS;INDEX message is displayed. SW field of the middle display is updated.

f. Message Format and Legal Entries. The following SYS;WARNS message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

SYS;WARNS;

SYS;WARNS;

SYS;WARNS identifies the message as the system warnings summary message. System warnings will be displayed starting on the line below the message mnemonic.

---

g. Exploded View. Not applicable.

CHAPTER 6

DATA BASE

OVERVIEW

This chapter describes the data base.

Section I provides information about data base files. It explains what the files are and the information they store.

Section II provides flowcharts that show you how to enter, update, transmit, record, and delete data base information.

Section III provides specific information about the message formats. Message formats are shown as they appear on the lower display of the BCU. An explanation of the mnemonics used and the legal data entries is also provided.

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Section I. DATA BASE FILES

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6-1. DATA BASE

The data base is composed of all the data stored in the BCS. It includes information on targets, known points, the fire unit, and much more. This information is organized into files to make storage and processing more efficient. The data base contains all of the information that the BCS needs to "know" in order to do its job.

6-1. DATA BASE - CONTINUED

As the tactical situation changes, some of this information will change. It is therefore vital that you keep the data base up-to-date. Most portions of the data base are discussed in this chapter. Three other categories of information within the data base structure are not discussed here because each is important enough to have a separate chapter devoted to it. Initialization (INIT) data is discussed in chapter 4. Fire plan processing is discussed in chapter 9. Fire mission processing is discussed in chapter 10.

6-2. DATA BASE FILE STRUCTURE

As you know, the information in the data base is organized into files. These files, in turn, are made up of records. This type of organization helps the BCS locate and store specific data much more efficiently. For example, all of the data about a single observer makes up an observer record. All observer records are combined to form an observer file. Figure 6-1 illustrates the relationship of data elements, records, and the observer file.

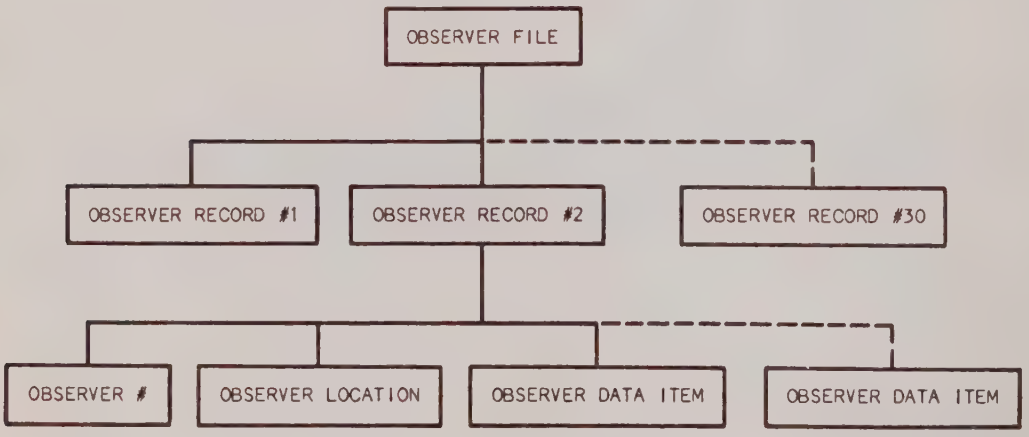

Figure 6-1. Observer File Structure

As you can see, data elements build the record for observer number 2. This observer record is combined with all the other observer records to form the observer file. The observer file is combined with all the other files to build the data base. The files which make up the data base are illustrated in figure 6-2.

6-2. DATA BASE FILE STRUCTURE - CONTINUED

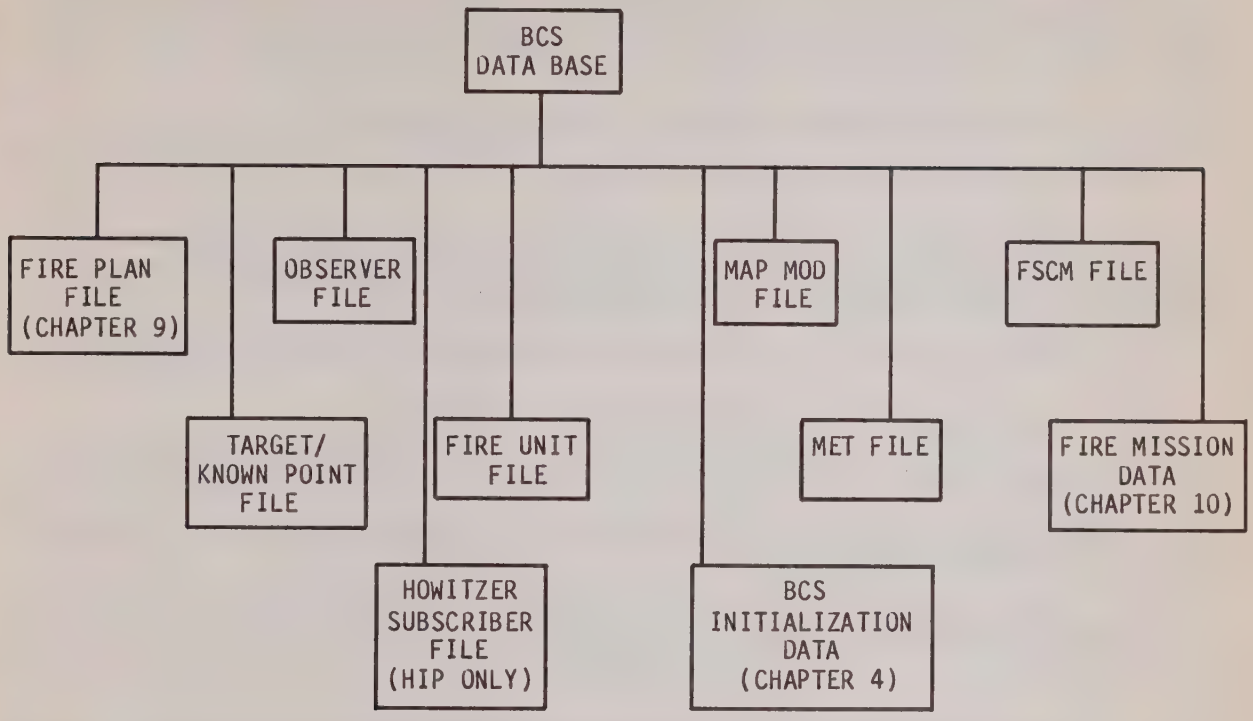

Figure 6-2. Data Base Files

6-3. FILE DESCRIPTIONS

The files which make up the data base are described in this paragraph.

a. Fire Unit File for Non-HIP Weapons. The fire unit file for non-HIP weapons stores information about your fire unit, which the BCS needs to process fire missions. The information stored is as follows:

(1) Specific information about the fire unit, such as its location and the weapon type and model being used.

(2) Detailed data for up to 12 howitzers.

(3) Ammunition data for up to 26 projectile lots, 9 powder lots, and 26 fuze types.

(4) Mask data for up to 24 masks with a maximum of 8 masks per howitzer.

(5) Muzzle velocity variation data for each howitzer.

(6) Registration corrections for up to eight different registrations.

6-3. FILE DESCRIPTIONS - CONTINUED

b. Fire Unit File for the HIP Weapon Model. The fire unit file for the HIP weapon stores information about your platoon, which the BCS needs to process fire missions. The information stored is as follows:

(1) Specific information about the howitzer location.

(2) Detailed data for up to 8 howitzers.

(3) Ammunition data for up to 26 projectile lots, 9 powder lots, and 26 fuze types. Platoon ammunition totals are stored in the AFU;BAMOUP message. Howitzer ammunition totals are stored in the HOW;AMOUP message.

(4) Mask data for up to 24 masks with a maximum of 8 masks per howitzer.

(5) Muzzle velocity variation data for each howitzer.

(6) Registration corrections for up to eight different registrations.

c. Map Mod File. The map mod file stores data which identifies the map boundaries of your area of operations.

d. Target/Known Point File. The target/known point file stores data for up to 120 targets and known points. A maximum of 99 known points can be stored due to the size of the KNPT field in the FM;RFAF message.

e. Observer Location File. The observer location file stores data for up to 30 observers.

f. Fire Support Coordination Measures (FSCM) File. The FSCM file stores data for up to 10 circular Restricted Fire Areas (RFA's), one 3-to-30-point zone, and one 2-to-30-point Front Line of Own Troops (FLOT).

g. MET File. The MET file contains two computer met messages (MET1 and MET2) and standard MET. The MET file stores meteorological data which is used to compensate for the effects of weather on the trajectory of the projectiles. Each MET message stores information about the MET station, up to 27 lines of MET data, and the length of time the MET data will be valid.

h. Howitzer Subscriber File (HIP only). The howitzer subscriber file stores data for up to eight howitzers. It contains information pertaining to the howitzer's name and the status, physical address, device type, logical name, and information pertaining to the subscribers it can communicate with.

i. Initialization Data. The data you enter into the data base to start up the BCS is discussed in chapter 4.

j. Fire Mission File. The data base stores data for up to five current missions. Fire mission data is discussed in chapter 10.

k. Fire Plan File. The fire plan file stores data for up to four fire plans. Refer to chapter 9 for a discussion of the fire plan file.

6-4. FILE MAINTENANCE

File maintenance consists of building a file and/or updating a file. File maintenance is performed after the BCS is initialized. It is done to keep your BCS as current as possible regarding changes in the tactical situation.

a. Building a File. You build a file by putting information into it. You may, for example, receive a new target or a new fire plan. When you execute the messages that contain this information, you are performing file maintenance by building a file.

b. Updating a File. You update a file by replacing obsolete information with current information. You may, for example, receive an updated ammunition count, a new MET;CM message, or a target to be deleted from a fire plan. When you execute the messages that contain this information, you are performing file maintenance by updating a file.

c. Entering Short Coordinates. Much of the building and updating of files involves entering locations. Once you have established your map mod, you can use short coordinates to enter a location (for example, a known point location). The BCS will convert short coordinates into long coordinates by adding high order digits. If you enter long coordinates, the BCS will verify that the long coordinates are inside the map mod area. Also, if you enter the coordinates of a point located in a grid zone next to the grid zone stored in the computer, the BCS will still be able to accept the coordinates. It will process the data using an automatic function called zone-to-zone transformation.

d. Maintaining the Data Base Files. In order to maintain the data base files, you enter data into various messages. Processing these messages enters the data into the corresponding data base files. The message formats used to maintain the data base files are as follows:

(1) Fire Unit File. Fire unit file data for non-HIP weapons is entered into the data base and is updated using the following messages:

- AFU;UPDATE message - used for fire unit data
- BCS;PIECES message - used for howitzer data
- AFU;BAMOUP message - used for ammunition data
- AFU;MASK message - used for mask data
- BCS;MVD message - used to calculate muzzle velocity variations
- BCS;MVV message - used to enter and store historical muzzle velocity data and to store measured muzzle velocity variation data
- AFU;REG message - used to display and update registration corrections.

Fire unit file data for the HIP weapon is entered into the data base and is updated using the following messages:

6-4. FILE MAINTENANCE - CONTINUED

- AFU;UPDATE message - used for fire unit data
- HOW;UPDATE message - used for howitzer data
- HOW;AMOUP message - used for howitzer ammunition data
- AFU;MASK message - used for mask data
- BCS;MVD message - used to calculate muzzle velocity variations
- BCS;MVV message - used to enter and store historical muzzle velocity data and to store measured muzzle velocity variation data.
- AFU;REG message - used to display and update registration corrections.

(2) Map Mod File. Map mod file data is entered into the data base and is updated using the SPRT;MAP message.

(3) Target/Known Point File. Target/known point data is entered into the data base and is updated using the FM;RFAF message. The FM;QF message can be used to assign a target as a known point. These two messages are fire mission message formats. Refer to chapter 10 for message formats and legal entries.

(4) Observer Location File. Observer location data is entered into the data base and is updated using the FM;OBCO message. When the observer's location is not known, a SPRT;LOC message may be used to determine the location and enter it into the file.

(5) Fire Support Coordination Measures File. FSCM data is entered into the FSCM file and is updated using the SPRT;BGEOM and SPRT;ZNE messages.

(6) Met File. Unless new met data has been entered, both the MET1 and MET2 messages contain standard met. Met data is entered into the met file and is updated using the MET;CM message. A met message can be deleted from the data base by using the SYS;SETUP message. The entry in the METUSE field indicates the met in use. (Refer to paragraph 4-10 or 4-11.) If the weapon model loaded is HIP and the MET;CM message indicated in the METUSE field of the SYS;SETUP message is updated, both segments of the MET;CM message will be automatically transmitted to all howitzers if the ATHDB field of the SYS;SETUP message contains an entry. If the ATHDB field does not contain an entry, both segments of the MET;CM message will be posted in the input queue addressed for manual transmission to all howitzers. (Refer to paragraph 4-6). Data entered into a MET;CM message displayed from the BCS;DBSUM message (MET1 or MET2) will update that met message. Data entered into a MET;CM message displayed from the SYS;IQSUM message or the SYS;MSGSUM message will update the met message indicated in the METUPD field of the SYS;SETUP message. (Refer to paragraph 4-10 or 4-11.) When you execute a MET;CM message containing new met, the lines in the message replace only the corresponding lines in the met message. The rest of the met message remains as before. To ensure that only the new met is present in the met message, you can delete the old met using the SYS;SETUP message. If you delete a met message and do not enter new met, the message reverts to standard met. When

6-4. FILE MAINTENANCE - CONTINUED

the weapon model loaded is HIP and the entry in the METUSE field of the SYS;SETUP message is changed and the message is executed, the MET;CM message will be either transmitted automatically or posted in the input queue for manual transmission.

(7) Howitzer Subscriber File (HIP only). Data pertaining to the howitzers and their subscribers is entered into the data base and is updated using the HOW;SBT message. During initialization when the SYS;SBT message is executed, one HOW;SBT message will be displayed automatically for each howitzer you entered in the SYS;SBT message with a status of Y (on). The first line of the HOW;SBT message always contains information pertaining to the platoon. There are always eight HOW;SBT messages in file with the first line automatically filled out by the BCS. If the SYS;COMM message is updated, these changes are incorporated into the HOW;SBT messages.

If a message skeleton is selected and data is entered matching a data base record (for example, observer number) when the DELETE key is pressed, the matching record in the data base is deleted.

6-5. DATA BASE CONSTRUCTION

Once you have initialized the BCS as discussed in chapter 4, you must build or update the rest of the data base. The flowcharts in paragraphs 6-7 through 6-25 tell you which messages to use to build or update the remainder of the data base. The flowcharts should be used in the order in which they are presented.

Some of the messages used to complete the data base may or may not be required. This will depend on the types of information needed in the data base for your battery or platoon. For example, in some cases you will need to store data about masks. In other cases, you will not. You will process those messages which are appropriate for your battery or platoon. The messages are listed below in the order that they should be processed.

- AFU;MASK message (to enter mask data)
- BCS;MVV message (to enter measured (HIP weapon model only) or historical muzzle velocity data)
- BCS;MVD message (to calculate measured muzzle velocity variation data)
- FM;OBCO message (to enter observer data)
- SPRT;BGEOM message (to enter circular RFA and FLOT data)
- SPRT;ZNE message (to enter zone of responsibility)
- FM;RFAF message (to enter target/known point data)
- MET;CM message (to enter a new met).

6-6. RECORDING THE DATA BASE

Data used during operation of the BCS can be recorded on the tape in the TTU. This data can then be restored to the memory of the computer at a later time. When the data base is recorded on the TTU, the initialization data current at the time is also recorded. Later, this same data can be restored and the need to manually enter initialization data is eliminated. Remember, however, that when the restore procedure is completed, you must update any initialization data or data base information which has changed since the data base was recorded. Refer to paragraph 6-26 for the procedure to record the data base.

Section II. DATA BASE FLOWCHARTS

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Section II. DATA BASE FLOWCHARTS - CONTINUED

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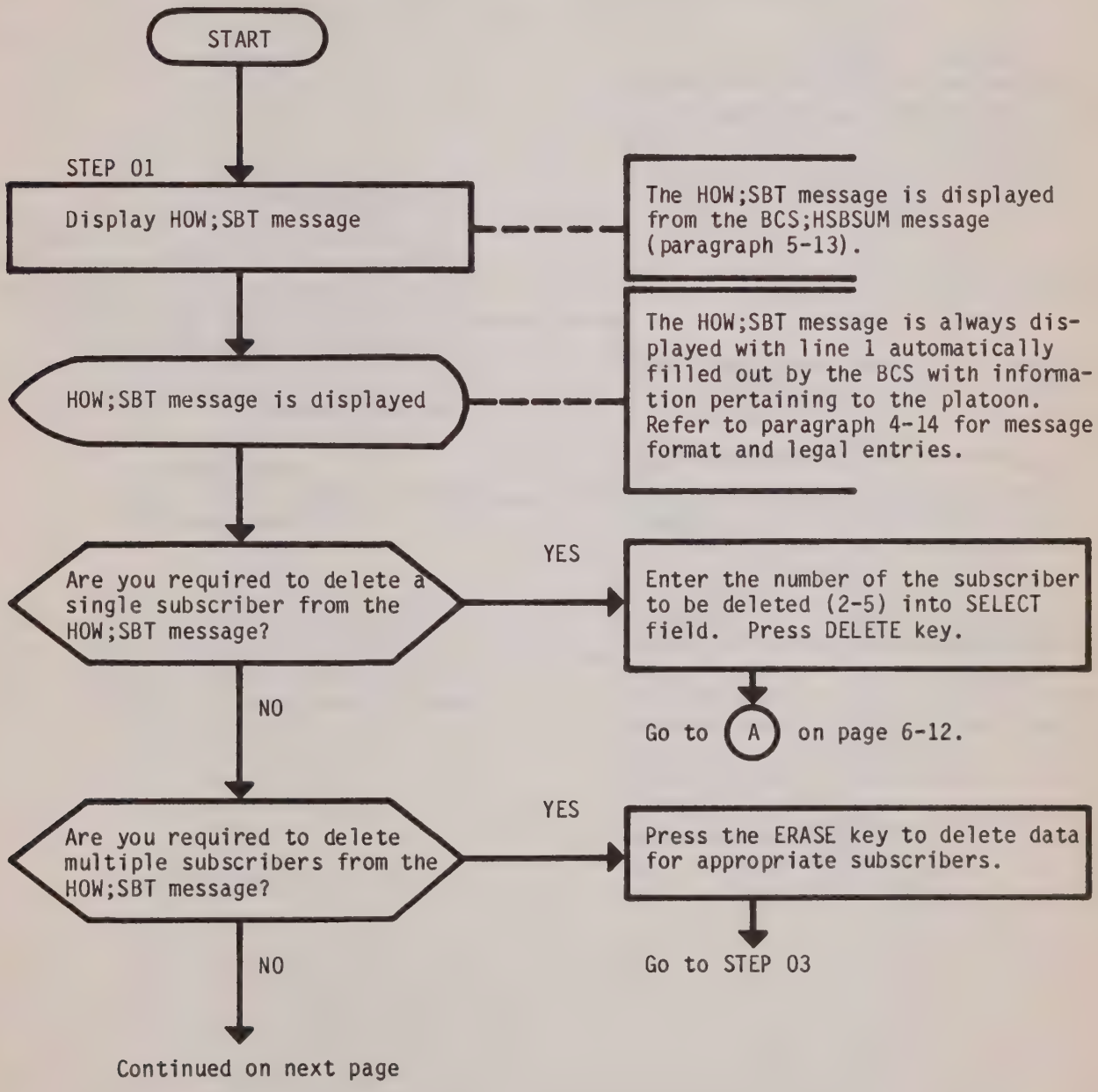
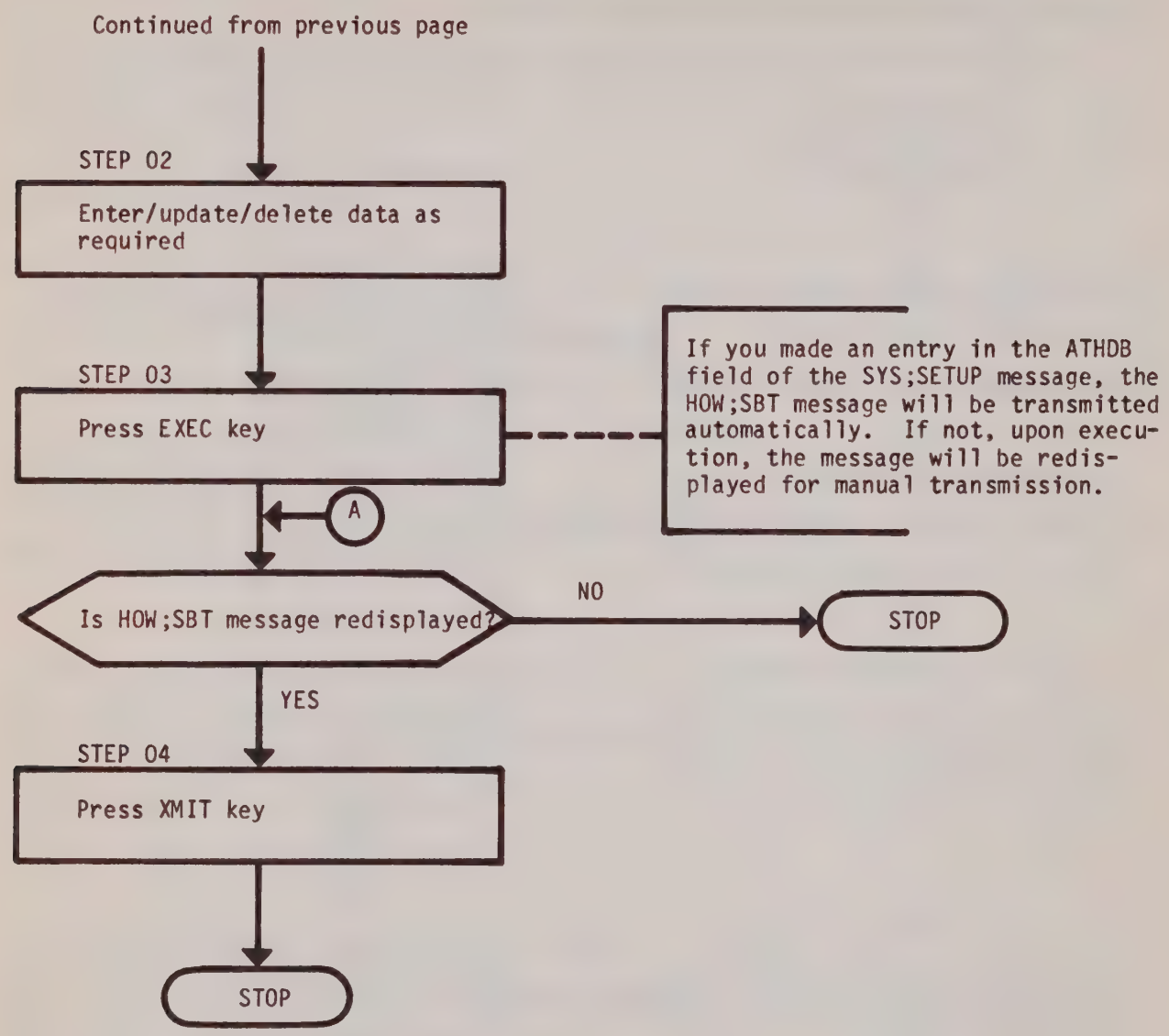
6-7. PROCESSING HOWITZER SUBSCRIBER INFORMATION USING THE HOW;SBT MESSAGE (HIP)

Use this flowchart to perform the following task:

- Process Howitzer Subscriber Information Using the HOW;SBT Message (HIP).


START
STEP 01
Display HOW;SBT message
The HOW;SBT message is displayed from the BCS;HSBSUM message (paragraph 5-13).
HOW;SBT message is displayed
The HOW;SBT message is always displayed with line 1 automatically filled out by the BCS with information pertaining to the platoon. Refer to paragraph 4-14 for message format and legal entries.
Are you required to delete a single subscriber from the HOW;SBT message?
YES
Enter the number of the subscriber to be deleted (2-5) into SELECT field. Press DELETE key.
Go to A on page 6-12.
NO
Are you required to delete multiple subscribers from the HOW;SBT message?
YES
Press the ERASE key to delete data for appropriate subscribers.
Go to STEP 03
NO
Continued on next page

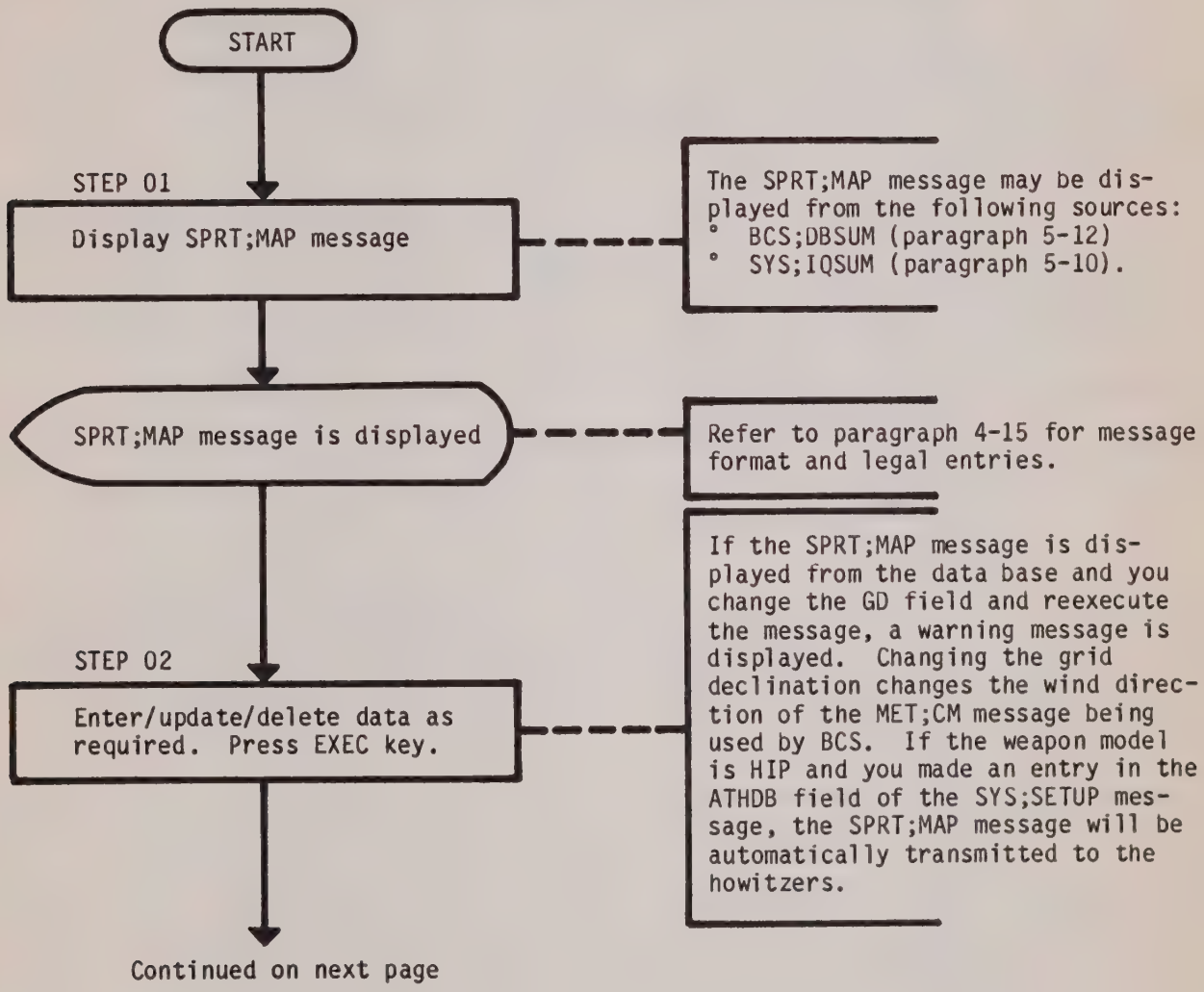
6-7. PROCESSING HOWITZER SUBSCRIBER INFORMATION USING THE HOW;SBT MESSAGE (HIP) - CONTINUED


Continued from previous page
STEP 02
Enter/update/delete data as required
STEP 03
Press EXEC key
If you made an entry in the ATHDB field of the SYS;SETUP message, the HOW;SBT message will be transmitted automatically. If not, upon execution, the message will be redisplayed for manual transmission.
A
Is HOW;SBT message redisplayed?
NO
STOP
YES
STEP 04
Press XMIT key
STOP

6-8. PROCESSING MAP MODIFICATION INFORMATION USING THE SPRT;MAP MESSAGE

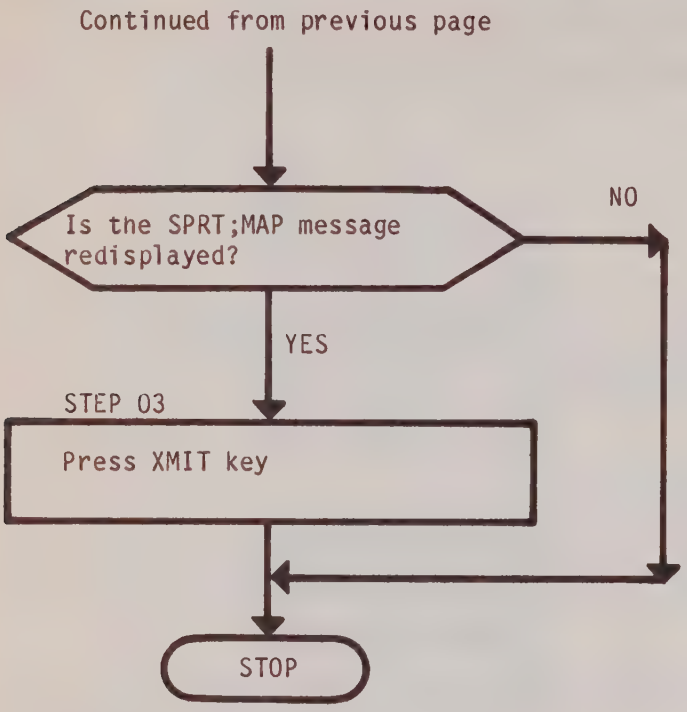
Use this flowchart to perform the following task:

- Process Map Modification Information Using the SPRT;MAP Message.


START
STEP 01
Display SPRT;MAP message
The SPRT;MAP message may be displayed from the following sources:
° BCS;DBSUM (paragraph 5-12)
° SYS;IQSUM (paragraph 5-10).
SPRT;MAP message is displayed
Refer to paragraph 4-15 for message format and legal entries.
STEP 02
Enter/update/delete data as required. Press EXEC key.
If the SPRT;MAP message is displayed from the data base and you change the GD field and reexecute the message, a warning message is displayed. Changing the grid declination changes the wind direction of the MET;CM message being used by BCS. If the weapon model is HIP and you made an entry in the ATHDB field of the SYS;SETUP message, the SPRT;MAP message will be automatically transmitted to the howitzers.

Continued on next page

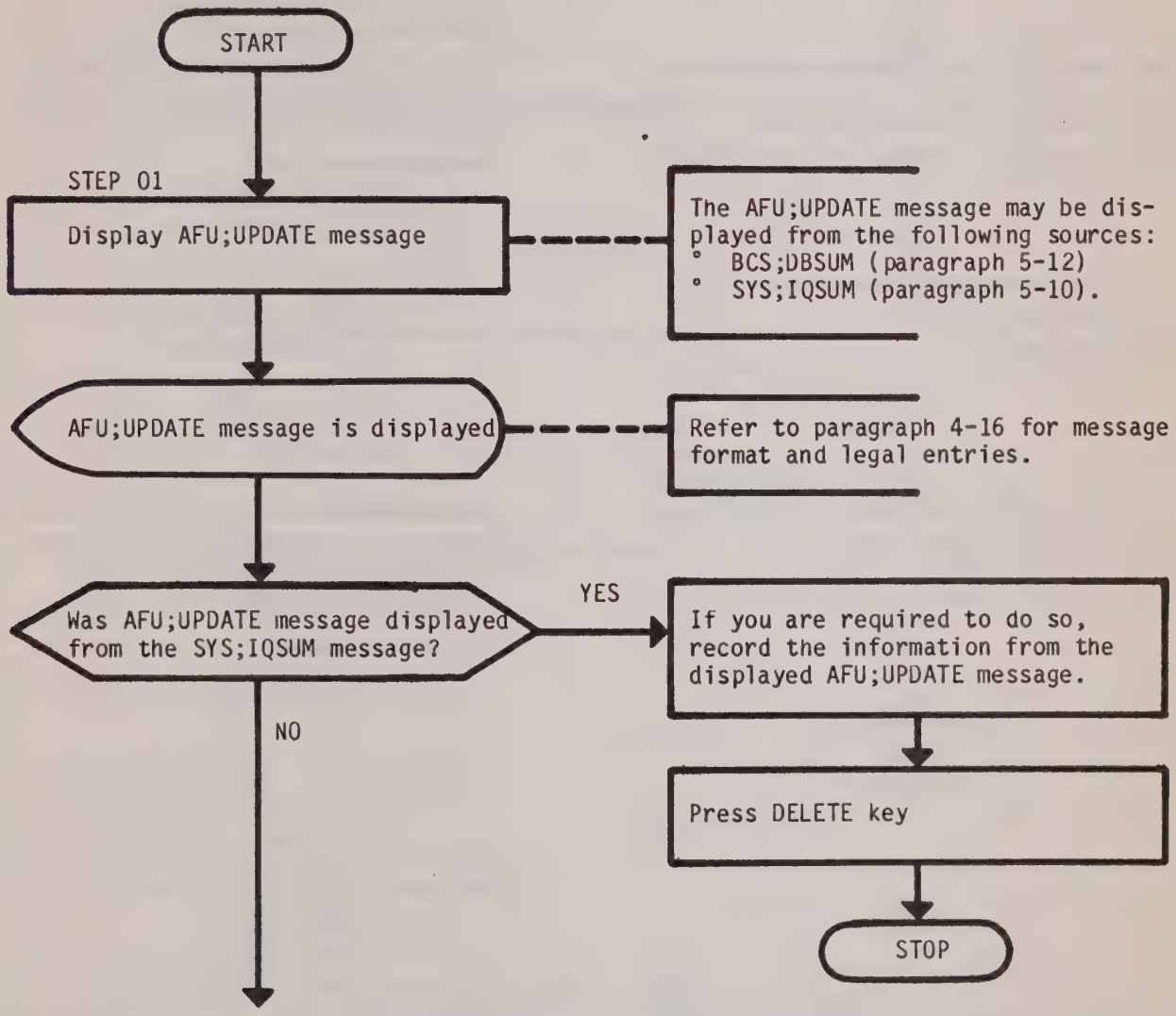
6-8. PROCESSING MAP MODIFICATION INFORMATION USING THE SPRT;MAP MESSAGE - CONTINUED



6-9. PROCESSING FIRE UNIT INFORMATION USING THE AFU;UPDATE MESSAGE

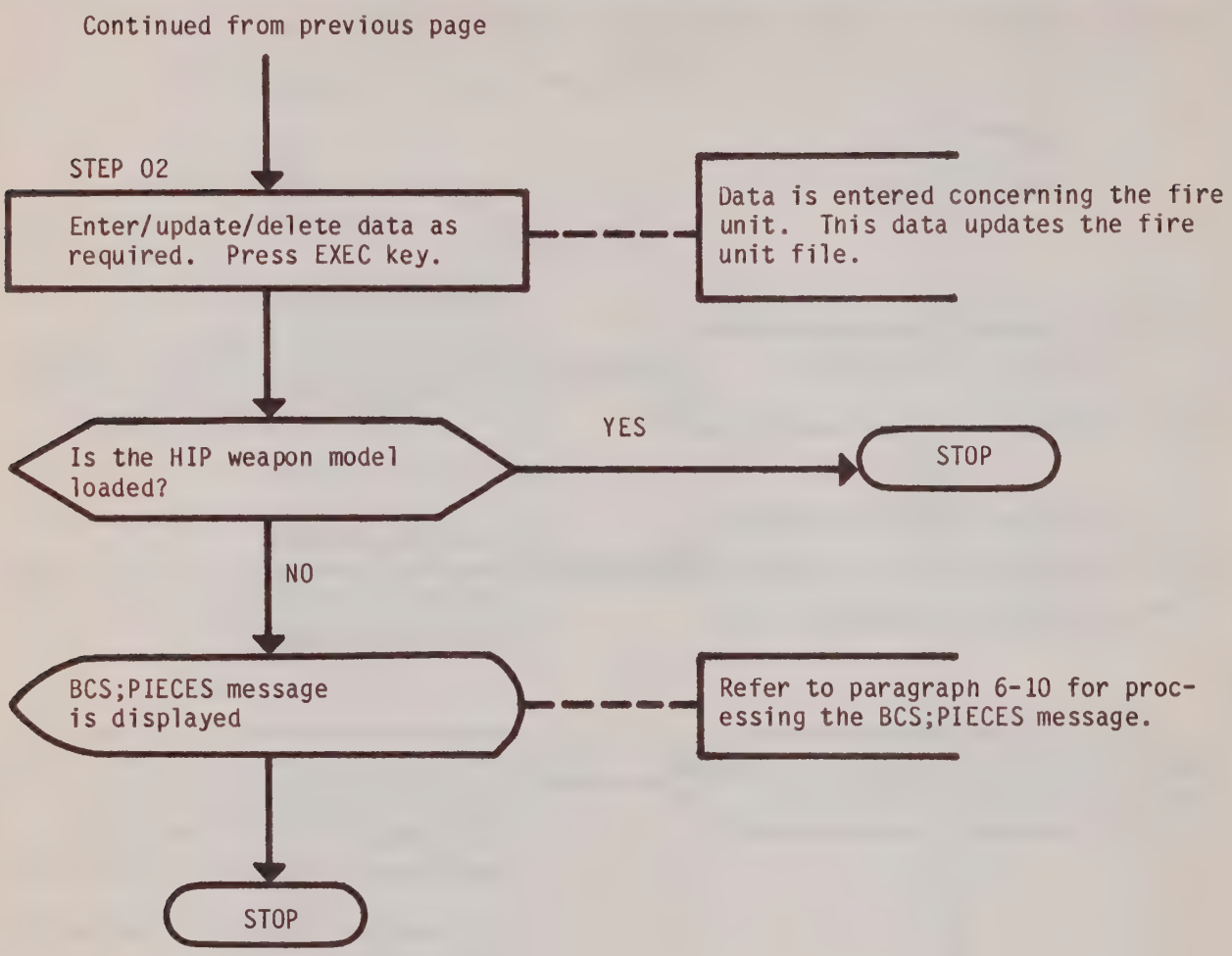
Use this flowchart to perform the following task:

- Process Fire Unit Information Using the AFU;UPDATE Message.


START
STEP 01
Display AFU;UPDATE message
The AFU;UPDATE message may be displayed from the following sources:
° BCS;DBSUM (paragraph 5-12)
° SYS;IQSUM (paragraph 5-10).
AFU;UPDATE message is displayed
Refer to paragraph 4-16 for message format and legal entries.
Was AFU;UPDATE message displayed from the SYS;IQSUM message?
YES
If you are required to do so, record the information from the displayed AFU;UPDATE message.
NO
Press DELETE key
STOP

Continued on next page

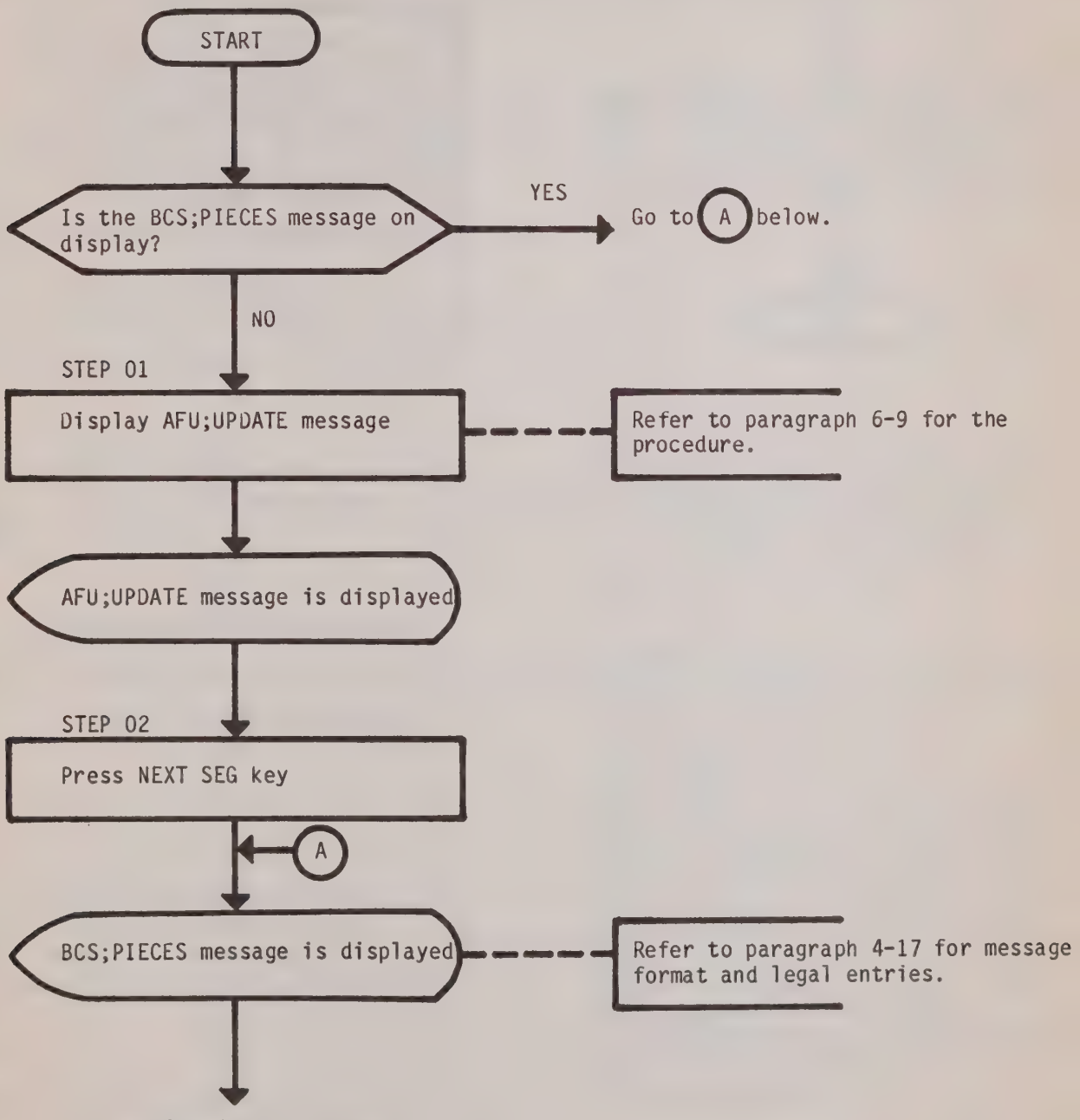
6-9. PROCESSING FIRE UNIT INFORMATION USING THE AFU;UPDATE MESSAGE - CONTINUED


Continued from previous page
STEP 02
Enter/update/delete data as required. Press EXEC key.
Data is entered concerning the fire unit. This data updates the fire unit file.
Is the HIP weapon model loaded?
YES
STOP
NO
BCS;PIECES message is displayed
Refer to paragraph 6-10 for processing the BCS;PIECES message.
STOP

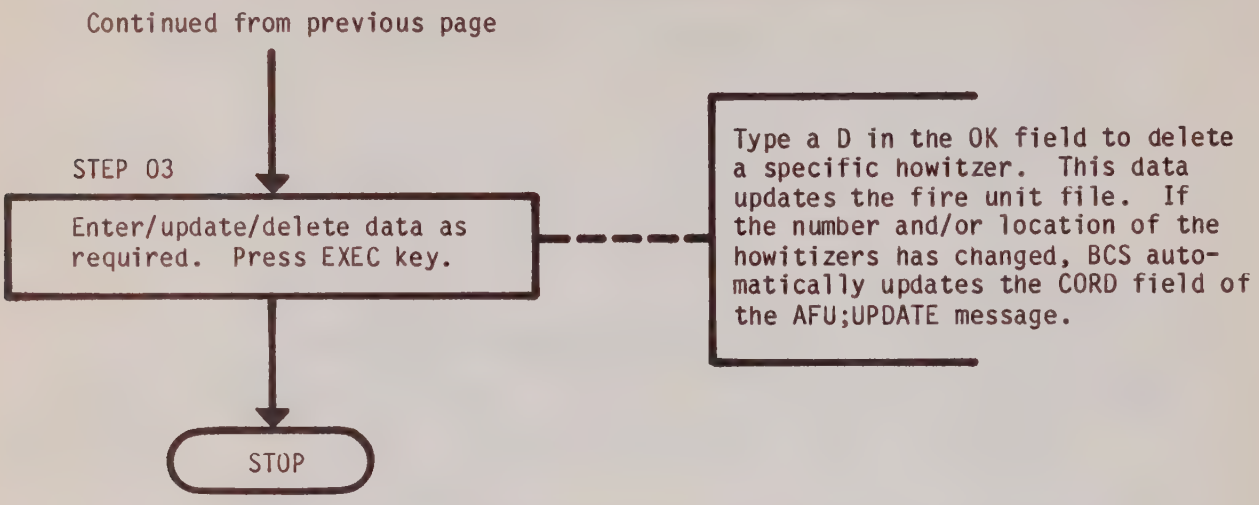
6-10. PROCESSING BCS PIECE INFORMATION USING THE BCS;PIECES MESSAGE (NON-HIP)

Use this flowchart to perform the following task:

° Process BCS Piece Information Using the BCS;PIECES Message (Non-HIP).



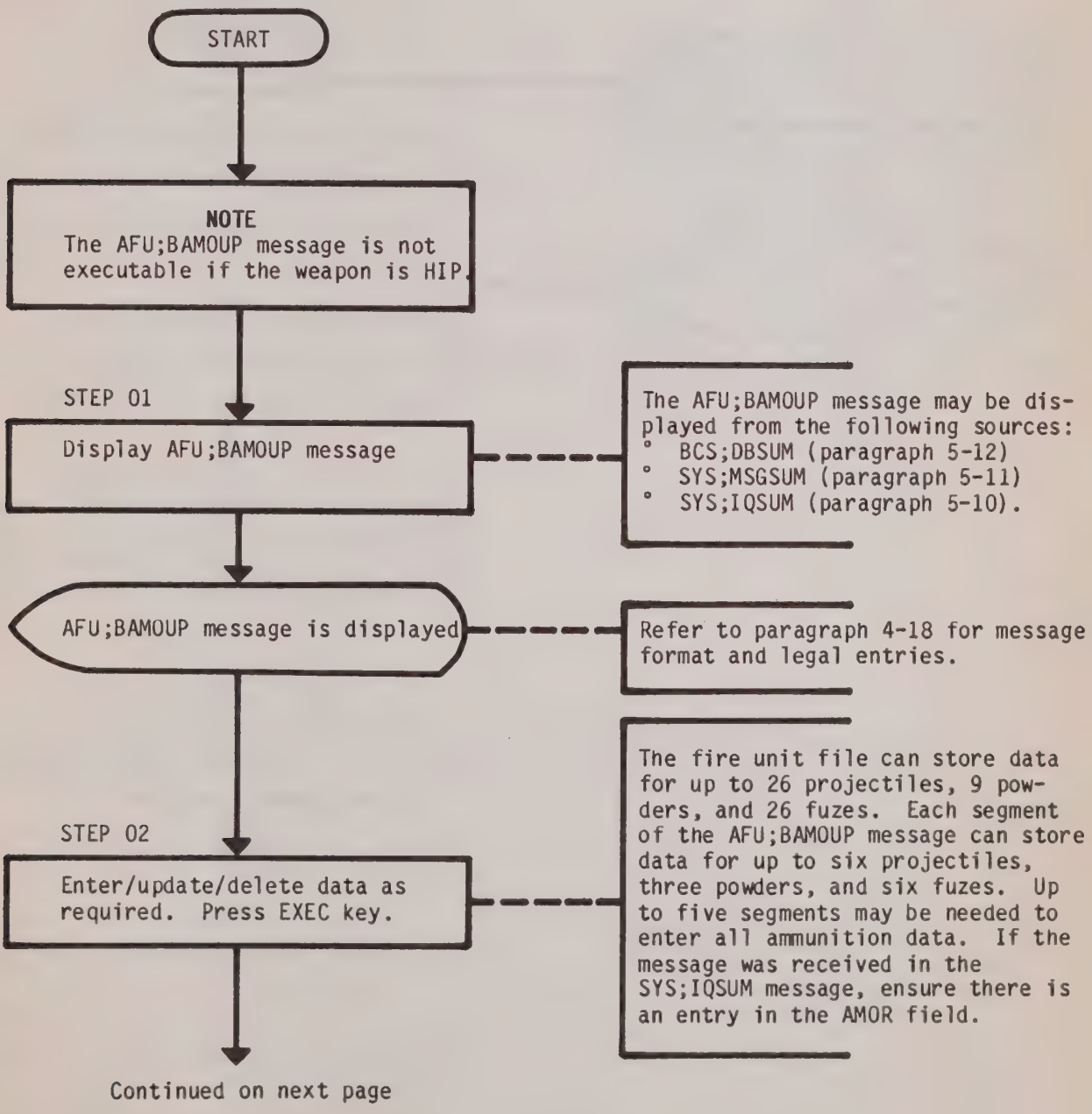
6-10. PROCESSING BCS PIECE INFORMATION USING THE BCS;PIECES MESSAGE (NON-HIP) - CONTINUED


Continued from previous page
STEP 03
Enter/update/delete data as required. Press EXEC key.
Type a D in the OK field to delete a specific howitzer. This data updates the fire unit file. If the number and/or location of the howitzers has changed, BCS automatically updates the CORD field of the AFU;UPDATE message.
STOP

6-11. PROCESSING FIRE UNIT AMMUNITION INFORMATION USING THE AFU;BAMOUP MESSAGE (NON-HIP)

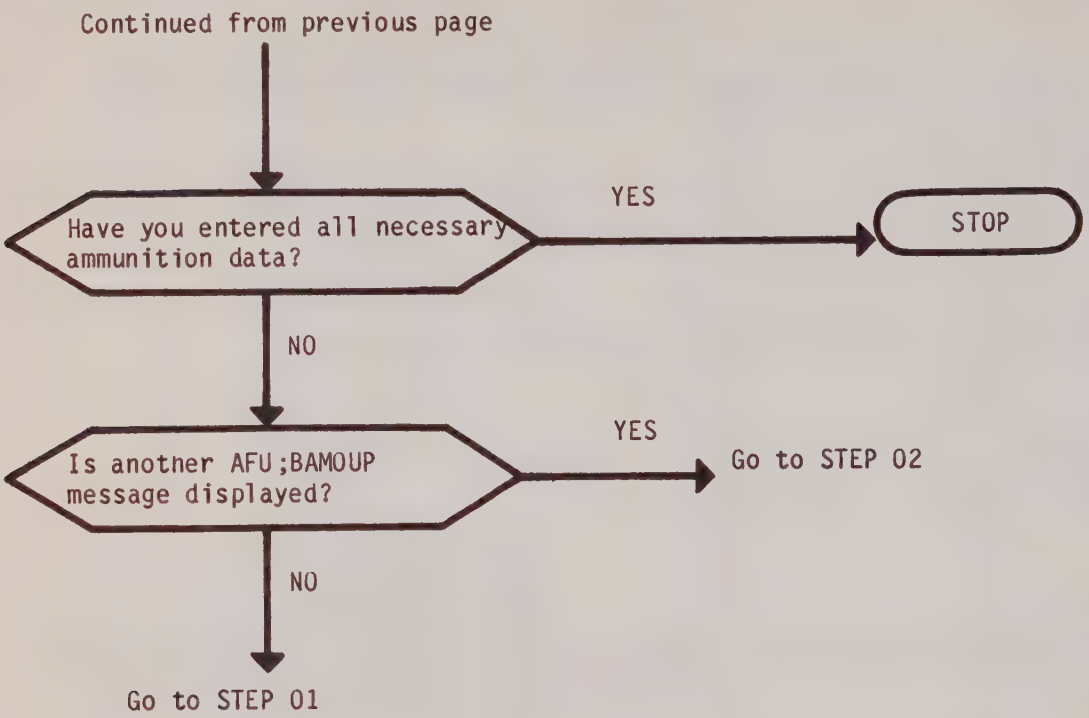
Use this flowchart to perform the following task:

- Process Fire Unit Ammunition Information Using the AFU;BAMOUP Message (Non-HIP).


START
NOTE
The AFU;BAMOUP message is not executable if the weapon is HIP.
STEP 01
Display AFU;BAMOUP message
The AFU;BAMOUP message may be displayed from the following sources:
° BCS;DBSUM (paragraph 5-12)
° SYS;MSGSUM (paragraph 5-11)
° SYS;IQSUM (paragraph 5-10).
AFU;BAMOUP message is displayed
Refer to paragraph 4-18 for message format and legal entries.
STEP 02
Enter/update/delete data as required. Press EXEC key.
The fire unit file can store data for up to 26 projectiles, 9 powders, and 26 fuzes. Each segment of the AFU;BAMOUP message can store data for up to six projectiles, three powders, and six fuzes. Up to five segments may be needed to enter all ammunition data. If the message was received in the SYS;IQSUM message, ensure there is an entry in the AMOR field.

Continued on next page

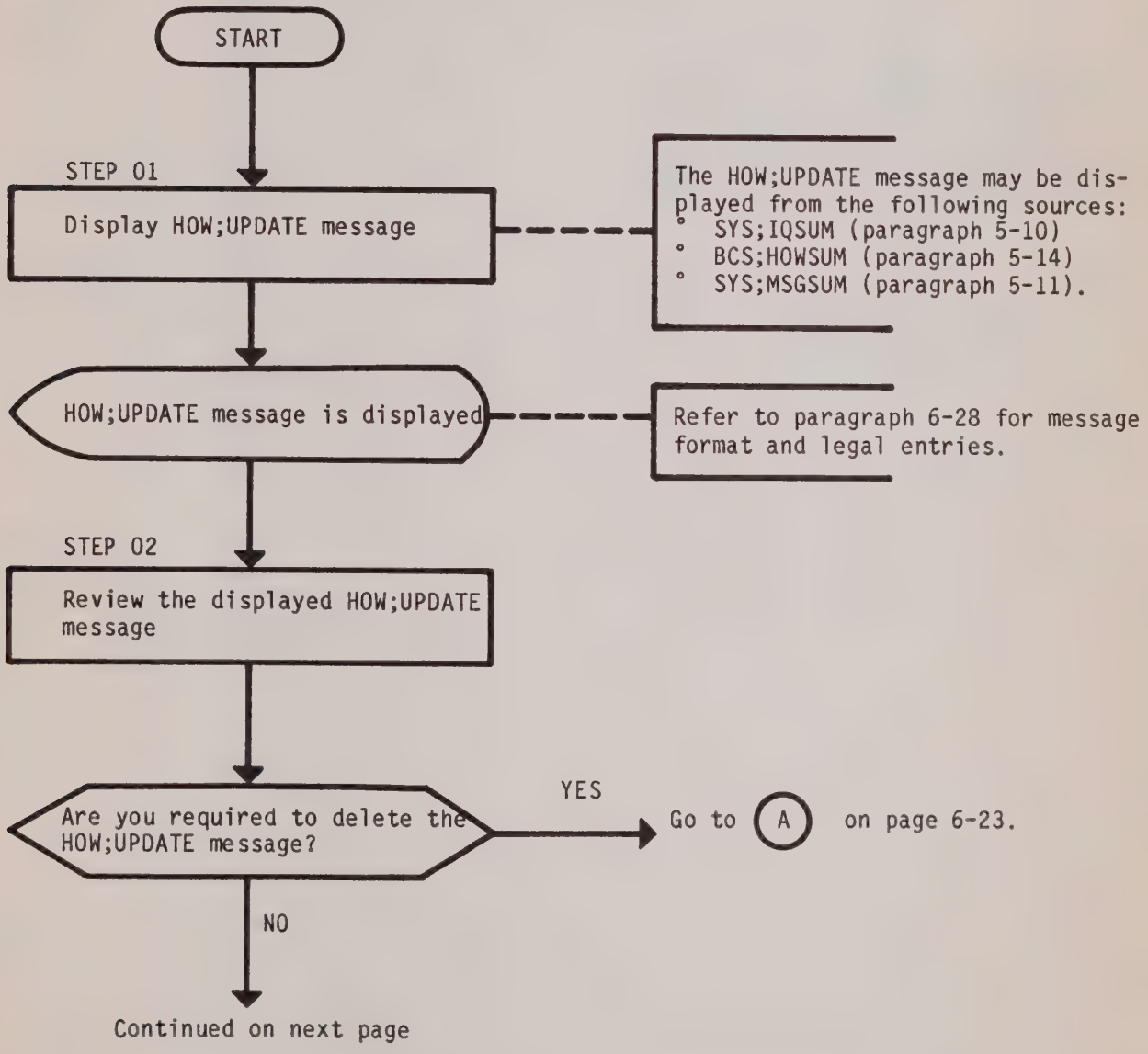
6-11. PROCESSING FIRE UNIT AMMUNITION INFORMATION USING THE AFU;BAMOUP MESSAGE (NON-HIP) - CONTINUED



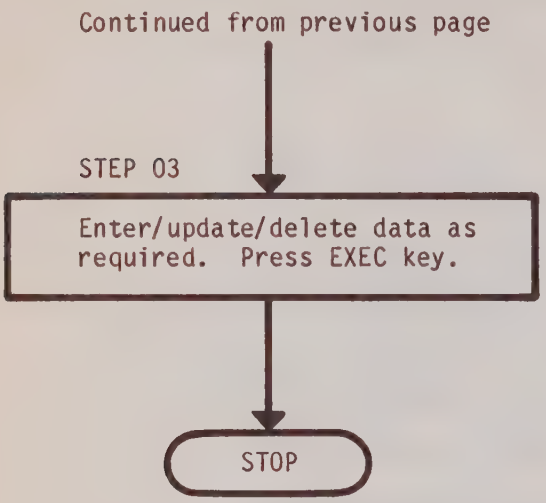
6-12. PROCESSING HOWITZER FIRE UNIT INFORMATION USING THE HOW;UPDATE MESSAGE (HIP)

Use this flowchart to perform the following task:

- Process Howitzer Fire Unit Information Using the HOW;UPDATE Message (HIP).

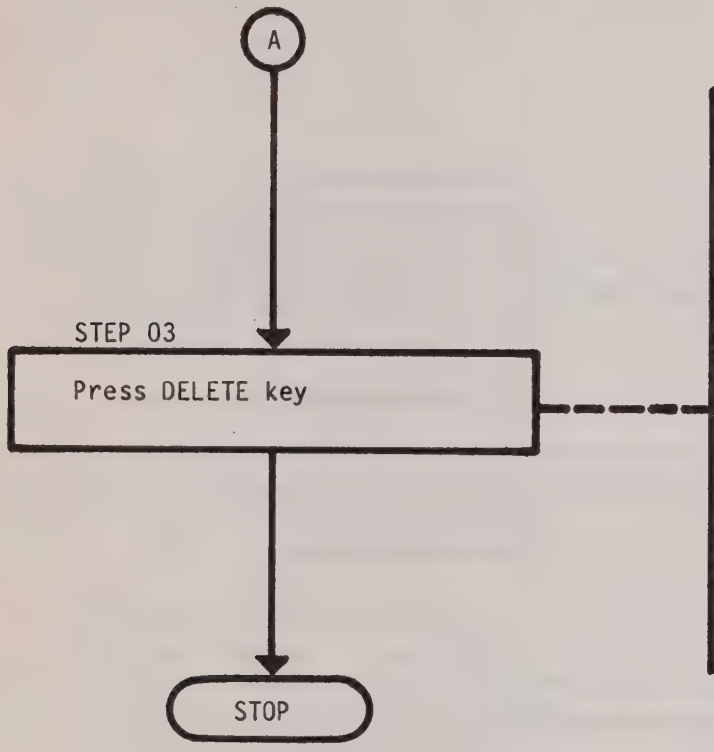

START
STEP 01
Display HOW;UPDATE message
The HOW;UPDATE message may be displayed from the following sources:
° SYS;IQSUM (paragraph 5-10)
° BCS;HOWSUM (paragraph 5-14)
° SYS;MSGSUM (paragraph 5-11).
HOW;UPDATE message is displayed
Refer to paragraph 6-28 for message format and legal entries.
STEP 02
Review the displayed HOW;UPDATE message
Are you required to delete the HOW;UPDATE message?
YES
Go to (A) on page 6-23.
NO
Continued on next page

6-12. PROCESSING HOWITZER FIRE UNIT INFORMATION USING THE HOW;UPDATE MESSAGE (HIP) - CONTINUED



6-12. PROCESSING HOWITZER FIRE UNIT INFORMATION USING THE HOW;UPDATE MESSAGE (HIP) - CONTINUED

Continued from previous page

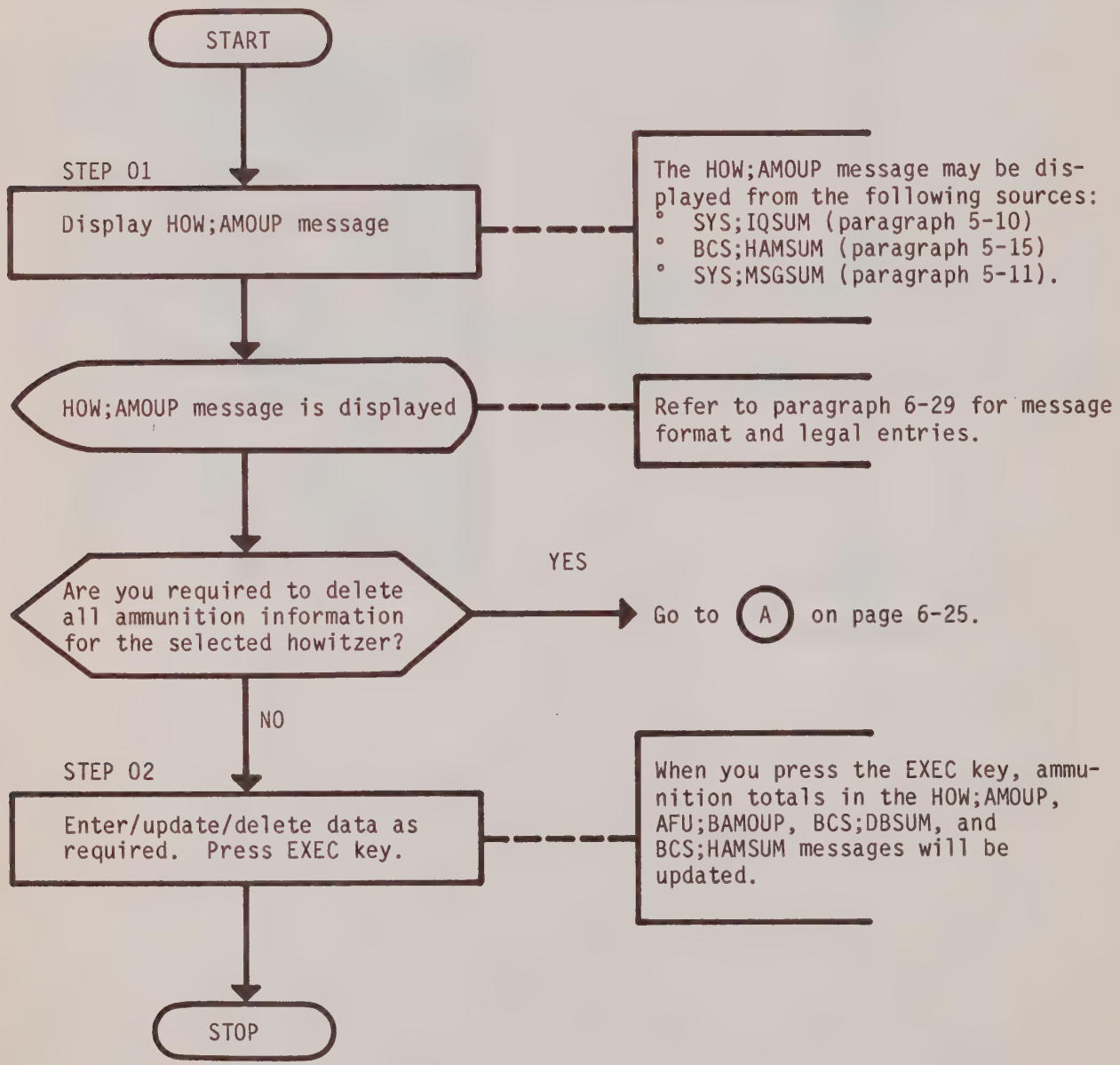


The displayed HOW;UPDATE message is deleted from the data base unless the howitzers status is L or R. A warning message will be displayed directing you to delete other data base messages for the deleted howitzer. If the deleted howitzer has a status of Y or S, the CORD field of the AFU;UPDATE message will be updated with the averages of the entries in the CORD fields in all HOW;UPDATE messages with an entry other than M or O. If there is no entry in the AZ field, it will be entered with the average of the AZ fields of the HOW;UPDATE messages in file with an entry in the STATUS field other than M or O.

6-13. PROCESSING HOWITZER AMMUNITION INFORMATION USING THE HOW;AMOUP MESSAGE (HIP)

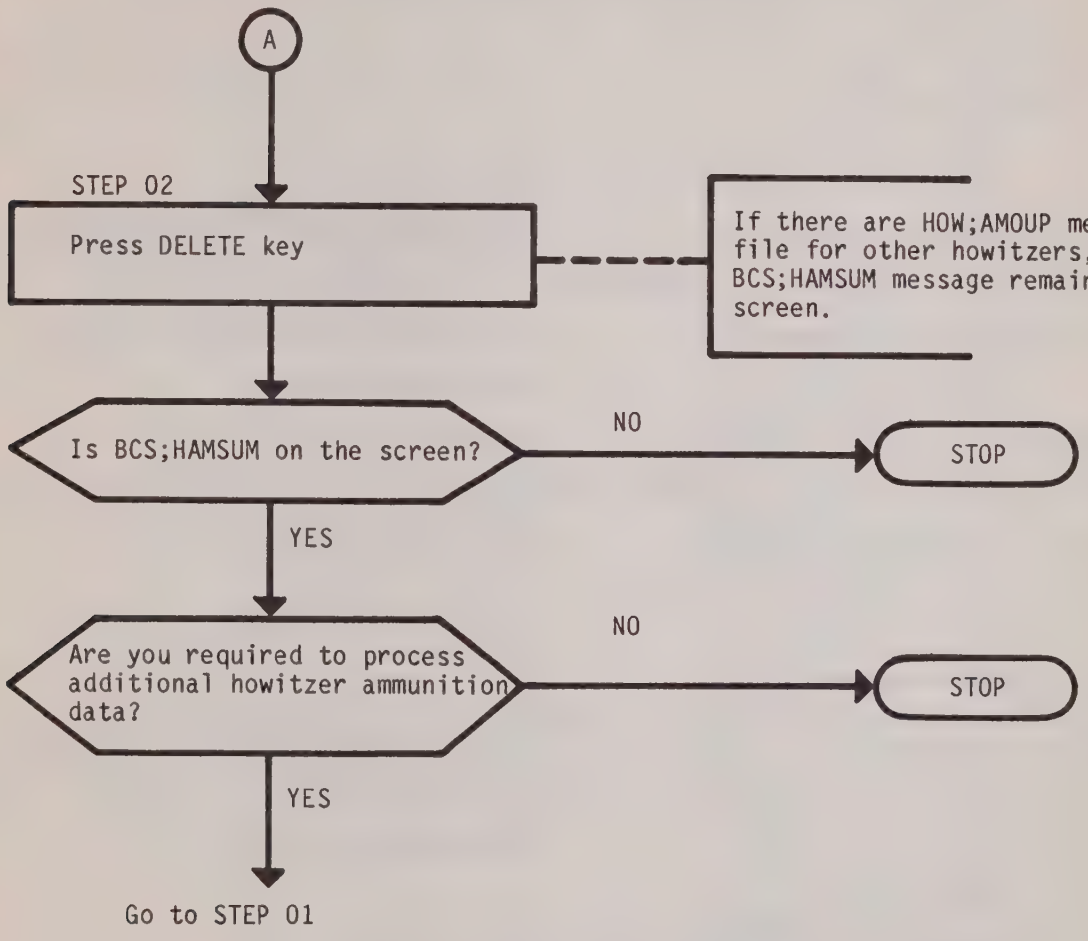
Use this flowchart to perform the following task:

- Process Howitzer Ammunition Information Using the HOW;AMOUP Message (HIP).


START
STEP 01
Display HOW;AMOUP message
The HOW;AMOUP message may be displayed from the following sources:
° SYS;IQSUM (paragraph 5-10)
° BCS;HAMSUM (paragraph 5-15)
° SYS;MSGSUM (paragraph 5-11).
HOW;AMOUP message is displayed
Refer to paragraph 6-29 for message format and legal entries.
Are you required to delete all ammunition information for the selected howitzer?
YES
Go to (A) on page 6-25.
NO
STEP 02
Enter/update/delete data as required. Press EXEC key.
When you press the EXEC key, ammunition totals in the HOW;AMOUP, AFU;BAMOUP, BCS;DBSUM, and BCS;HAMSUM messages will be updated.
STOP

6-13. PROCESSING HOWITZER AMMUNITION INFORMATION USING THE HOW;AMOUP MESSAGE (HIP) - CONTINUED

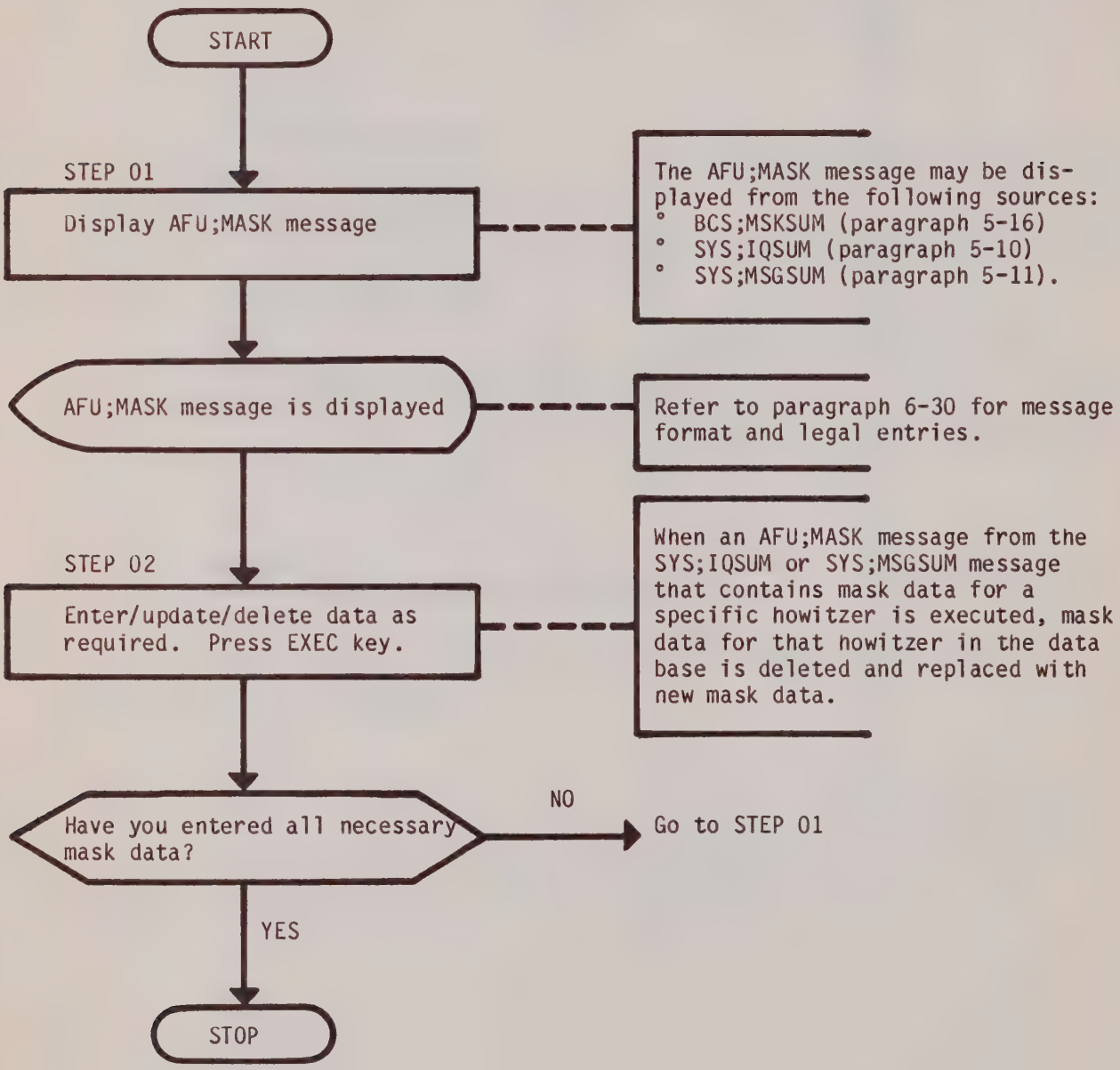
Continued from previous page



6-14. PROCESSING MASK INFORMATION USING THE AFU;MASK MESSAGE

Use this flowchart to perform the following task:

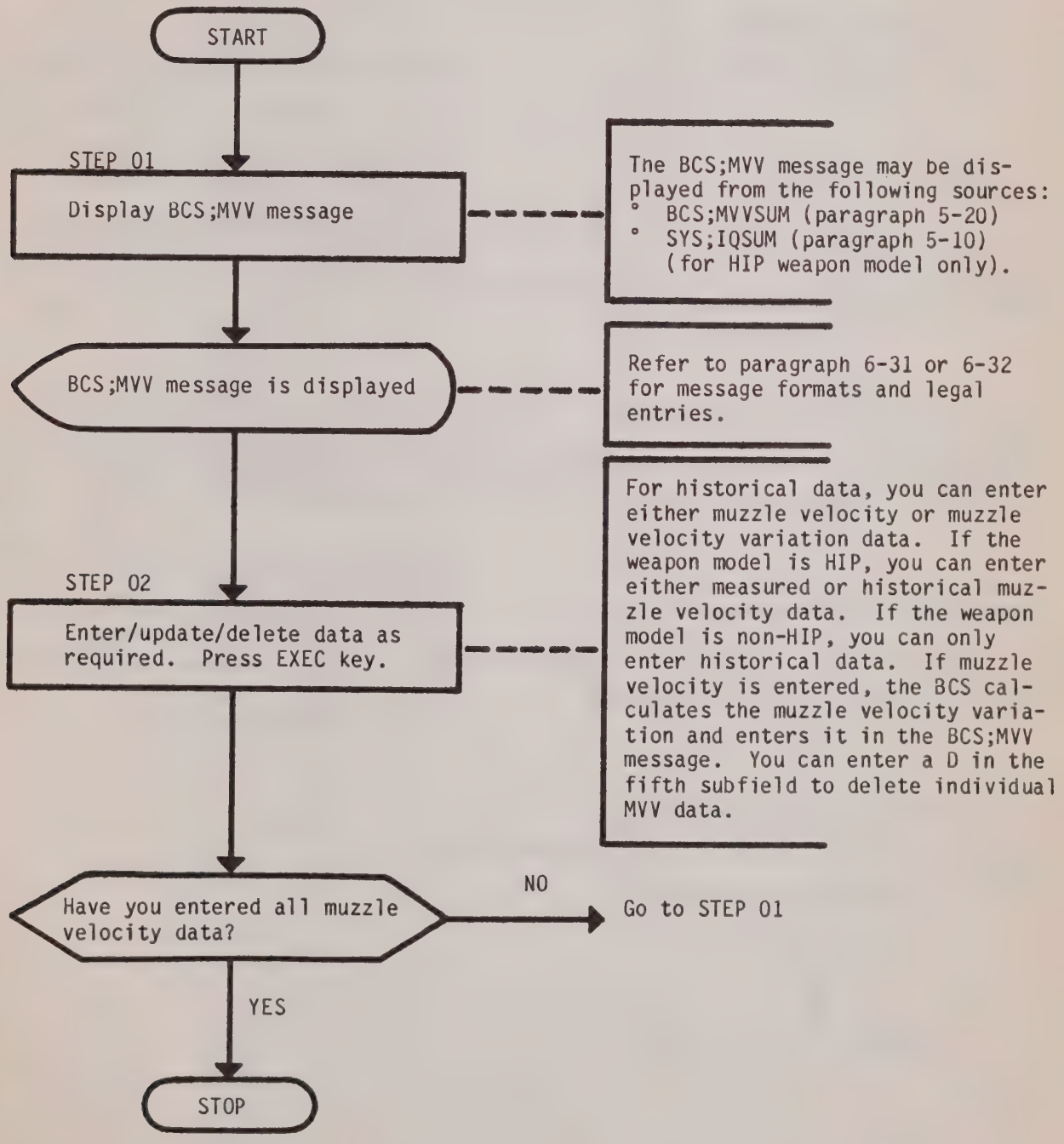
- Process Mask Information Using the AFU;MASK Message.


START
STEP 01
Display AFU;MASK message
The AFU;MASK message may be displayed from the following sources:
° BCS;MSKSUM (paragraph 5-16)
° SYS;IQSUM (paragraph 5-10)
° SYS;MSGSUM (paragraph 5-11).
AFU;MASK message is displayed
Refer to paragraph 6-30 for message format and legal entries.
STEP 02
Enter/update/delete data as required. Press EXEC key.
When an AFU;MASK message from the SYS;IQSUM or SYS;MSGSUM message that contains mask data for a specific howitzer is executed, mask data for that howitzer in the data base is deleted and replaced with new mask data.
Have you entered all necessary mask data?
NO
Go to STEP 01
YES
STOP

6-15. PROCESSING MUZZLE VELOCITY INFORMATION USING THE BCS;MV MESSAGE

Use this flowchart to perform the following task:

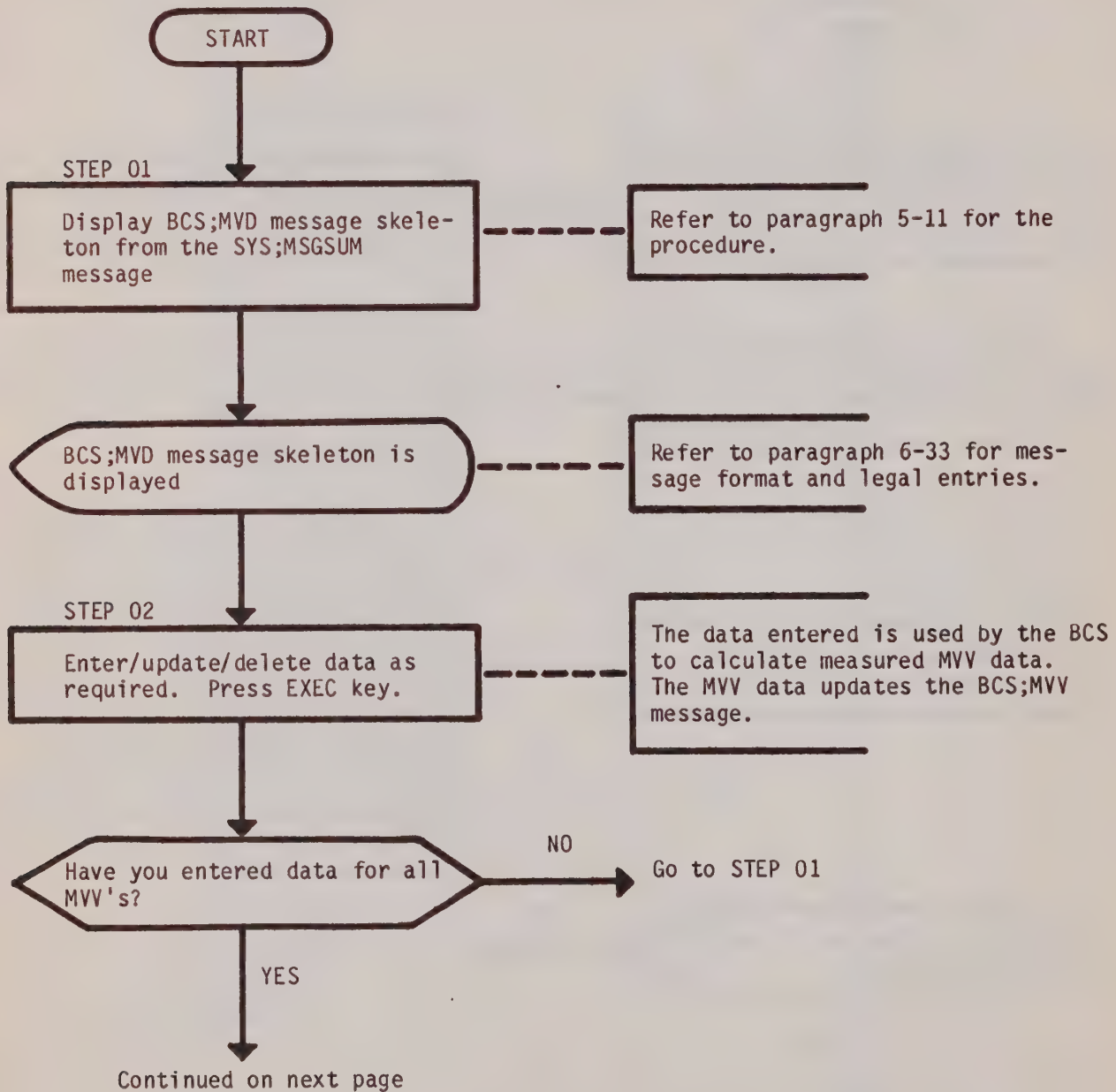
° Process Muzzle Velocity Information Using the BCS;MVV Message.


START
STEP 01
Display BCS;MVV message
The BCS;MVV message may be displayed from the following sources:
° BCS;MVVSUM (paragraph 5-20)
° SYS;IQSUM (paragraph 5-10) (for HIP weapon model only).
BCS;MVV message is displayed
Refer to paragraph 6-31 or 6-32 for message formats and legal entries.
STEP 02
Enter/update/delete data as required. Press EXEC key.
For historical data, you can enter either muzzle velocity or muzzle velocity variation data. If the weapon model is HIP, you can enter either measured or historical muzzle velocity data. If the weapon model is non-HIP, you can only enter historical data. If muzzle velocity is entered, the BCS calculates the muzzle velocity variation and enters it in the BCS;MVV message. You can enter a D in the fifth subfield to delete individual MVV data.
Have you entered all muzzle velocity data?
NO
Go to STEP 01
YES
STOP

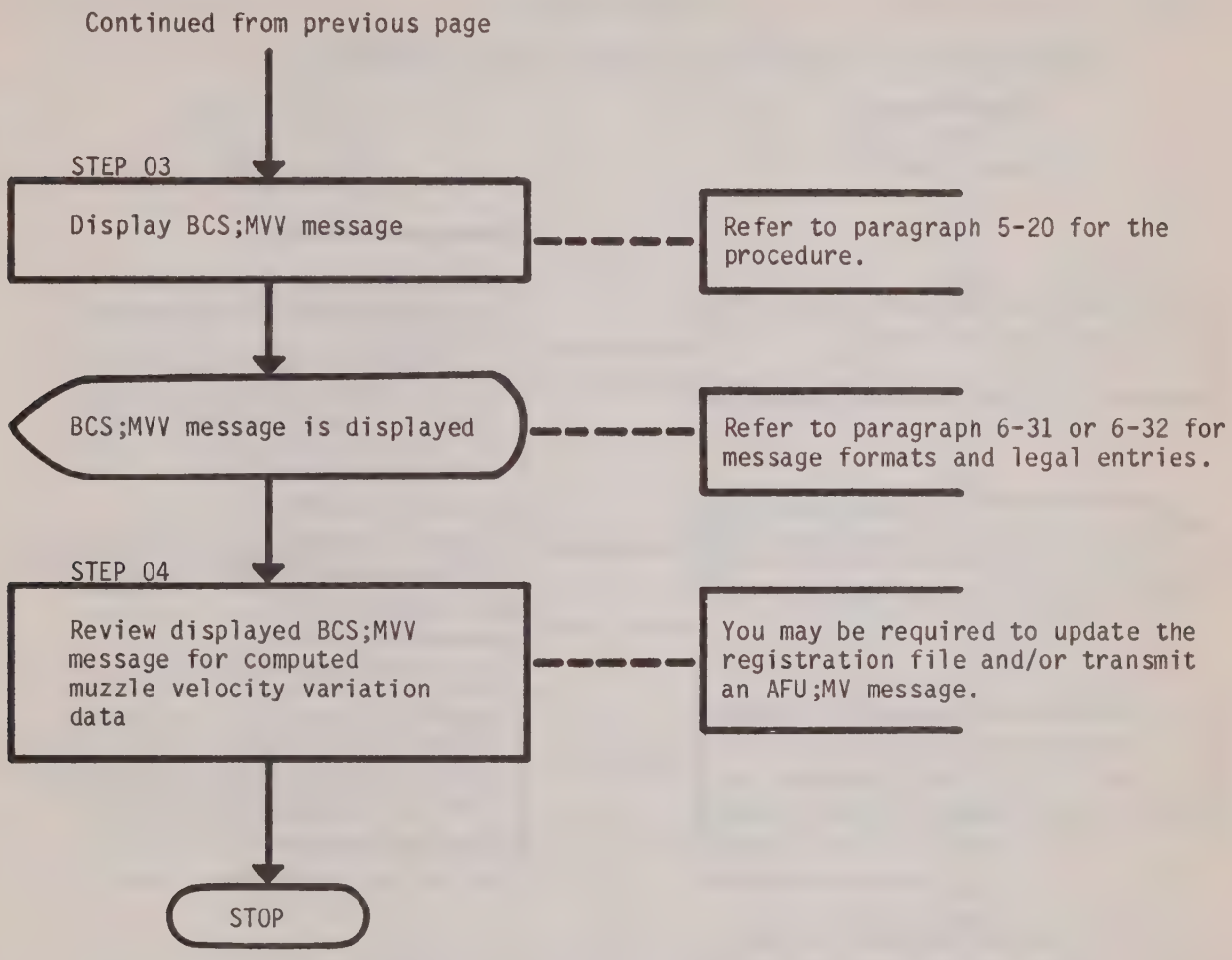
6-16. PROCESSING MEASURED MUZZLE VELOCITY INFORMATION USING THE BCS;MVD MESSAGE

Use this flowchart to perform the following task:

- Process Measured Muzzle Velocity Information Using the BCS;MVD Message.


START
STEP 01
Display BCS;MVD message skeleton from the SYS;MSGSUM message
Refer to paragraph 5-11 for the procedure.
BCS;MVD message skeleton is displayed
Refer to paragraph 6-33 for message format and legal entries.
STEP 02
Enter/update/delete data as required. Press EXEC key.
The data entered is used by the BCS to calculate measured MVV data. The MVV data updates the BCS;MVV message.
Have you entered data for all MVV's?
NO
Go to STEP 01
YES
Continued on next page

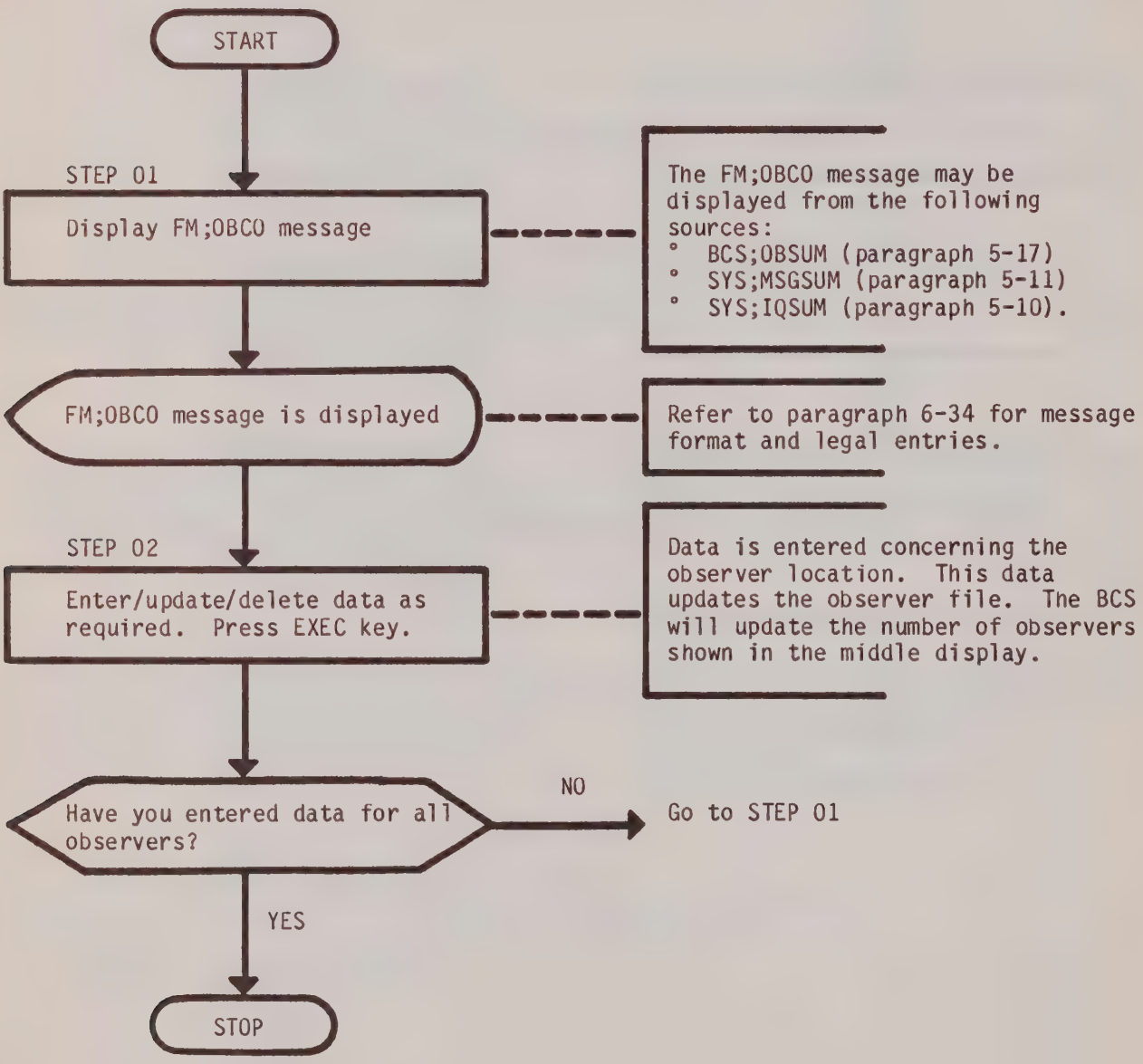
6-16. PROCESSING MEASURED MUZZLE VELOCITY INFORMATION USING THE BCS;MVD MESSAGE - CONTINUED


Continued from previous page
STEP 03
Display BCS;MVV message
Refer to paragraph 5-20 for the procedure.
BCS;MVV message is displayed
Refer to paragraph 6-31 or 6-32 for message formats and legal entries.
STEP 04
Review displayed BCS;MVV message for computed muzzle velocity variation data
You may be required to update the registration file and/or transmit an AFU;MV message.
STOP

6-17. PROCESSING OBSERVER INFORMATION USING THE FM;OBCO MESSAGE

Use this flowchart to perform the following task:

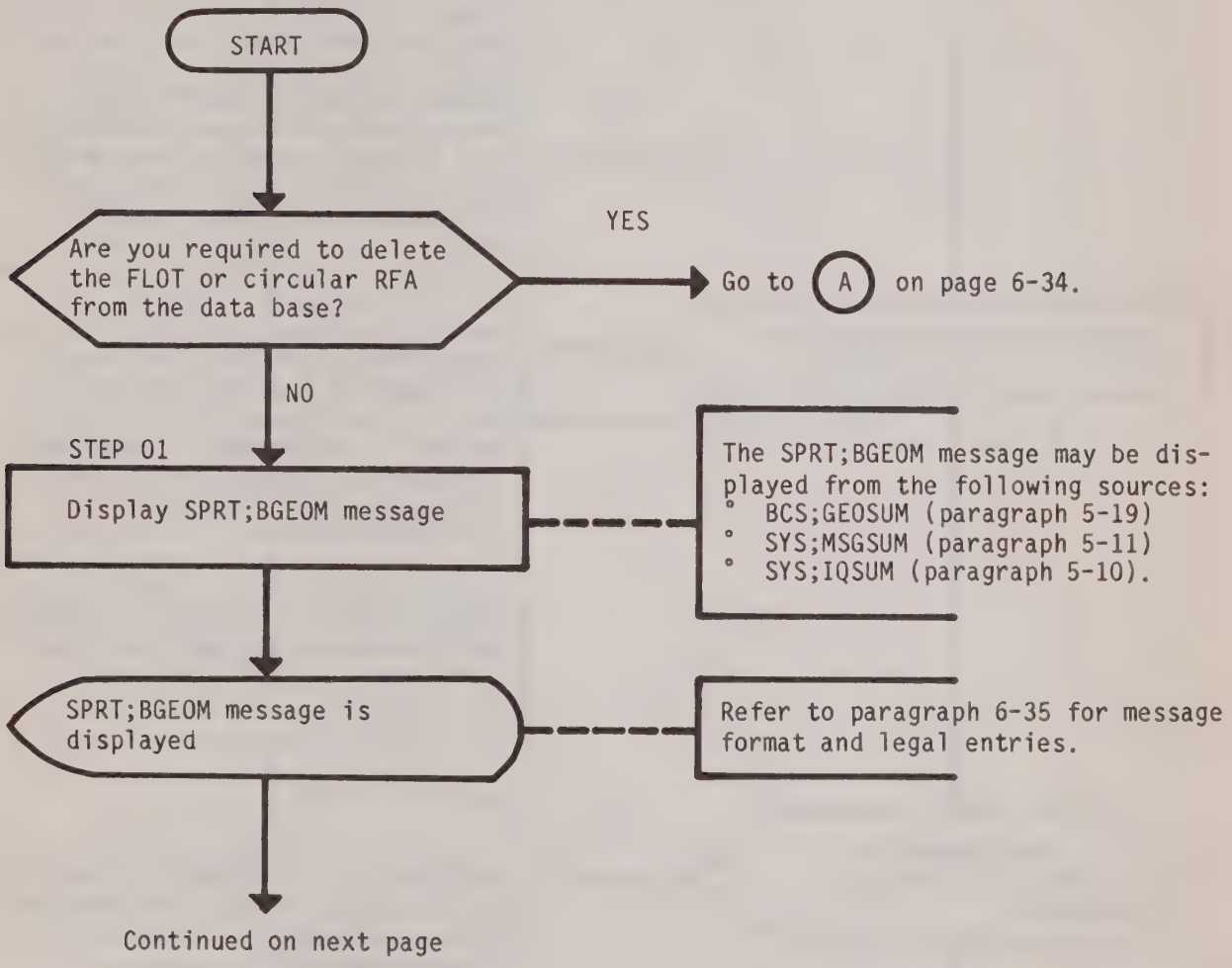
- Process Observer Information Using the FM;OBCO Message.


START
STEP 01
Display FM;OBCO message
The FM;OBCO message may be displayed from the following sources:
° BCS;OBSUM (paragraph 5-17)
° SYS;MSGSUM (paragraph 5-11)
° SYS;IQSUM (paragraph 5-10).
FM;OBCO message is displayed
Refer to paragraph 6-34 for message format and legal entries.
STEP 02
Enter/update/delete data as required. Press EXEC key.
Data is entered concerning the observer location. This data updates the observer file. The BCS will update the number of observers shown in the middle display.
Have you entered data for all observers?
NO
Go to STEP 01
YES
STOP

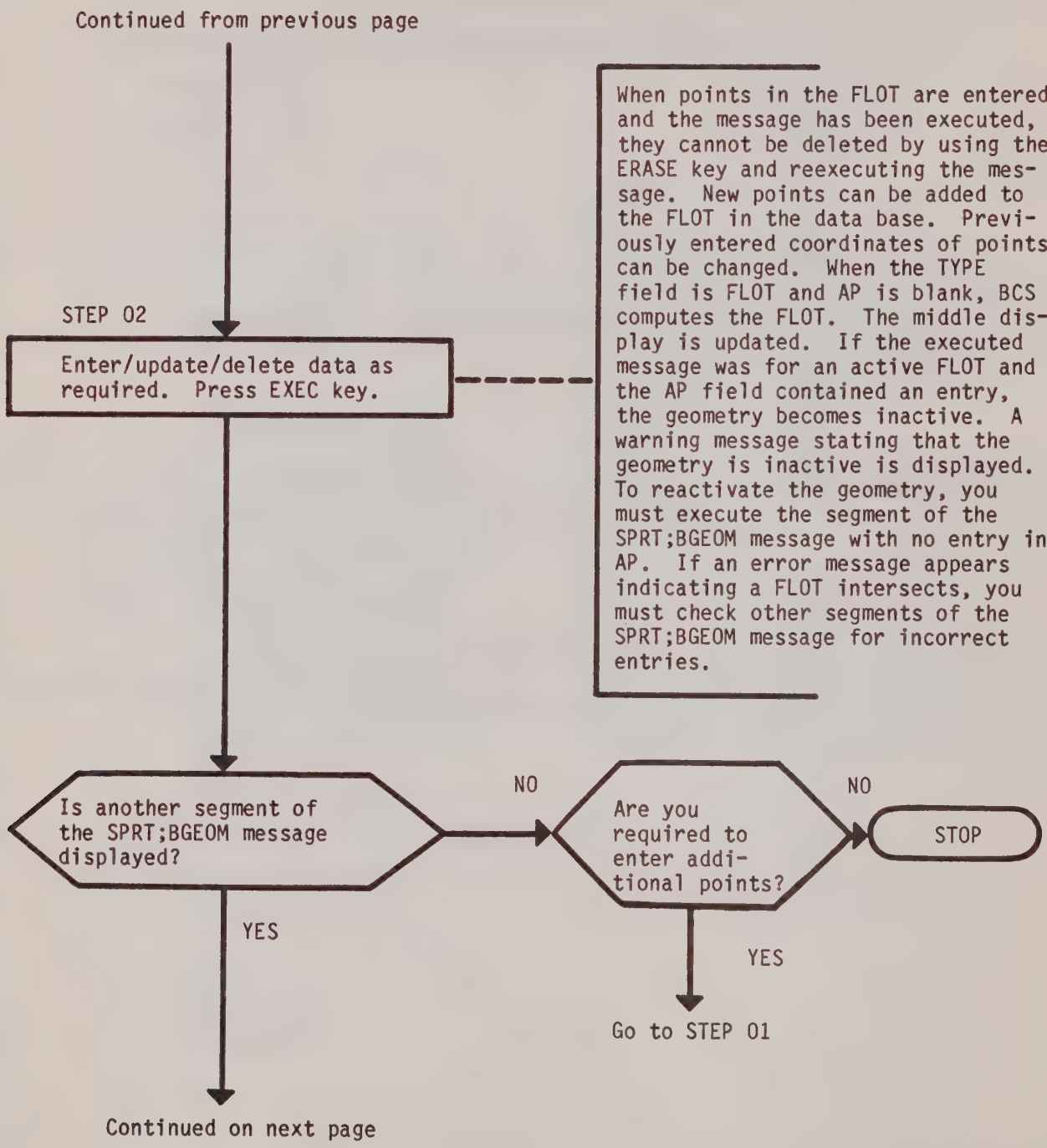
6-18. PROCESSING FLOT OR CIRCULAR RFA INFORMATION USING THE SPRT;BGEOM MESSAGE

Use this flowchart to perform the following task:

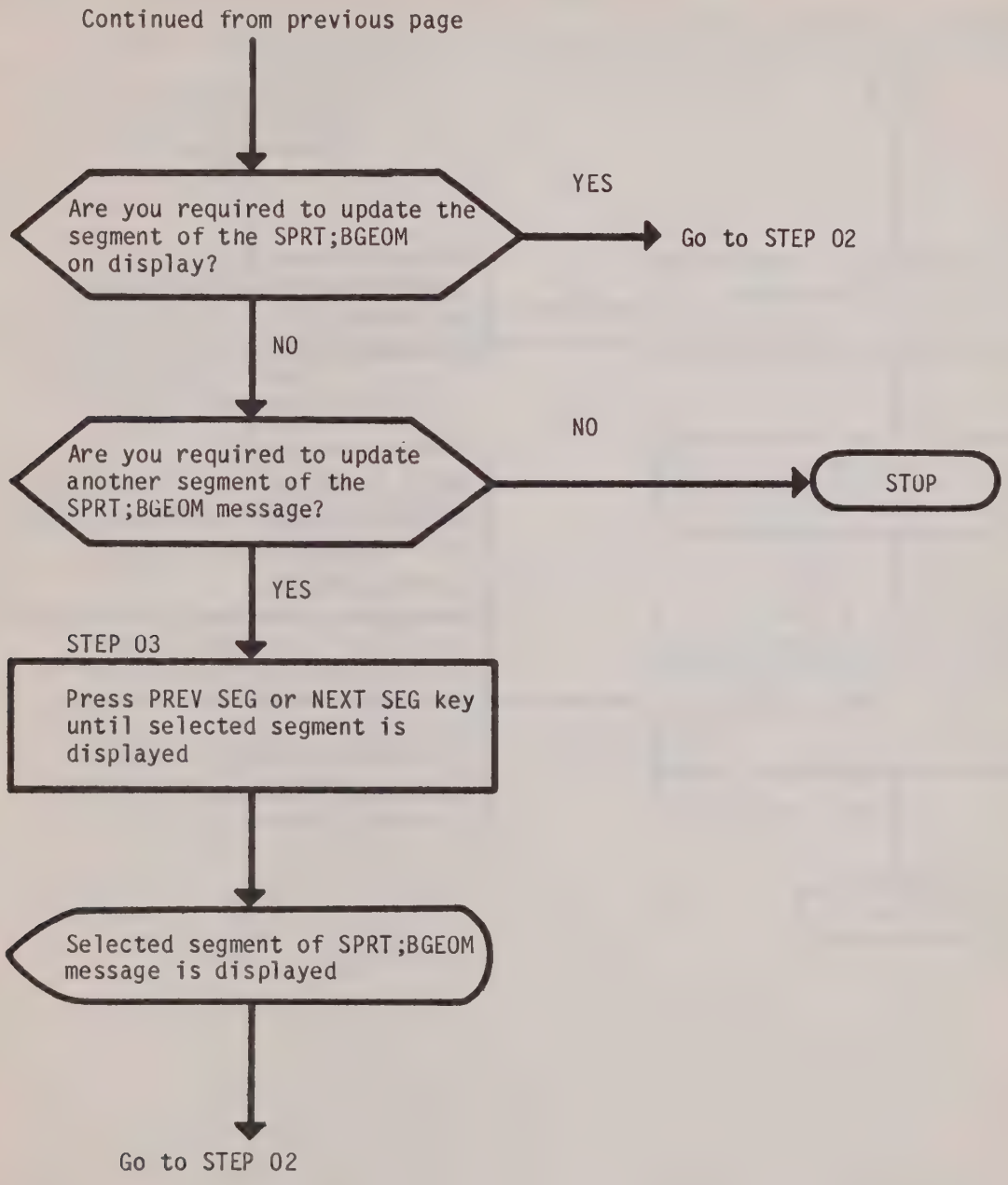
- Process FLOT or Circular RFA Information Using the SPRT;BGEOM Message.


START
Are you required to delete the FLOT or circular RFA from the data base?
YES
Go to (A) on page 6-34.
NO
STEP 01
Display SPRT;BGEOM message
The SPRT;BGEOM message may be displayed from the following sources:
° BCS;GEOSUM (paragraph 5-19)
° SYS;MSGSUM (paragraph 5-11)
° SYS;IQSUM (paragraph 5-10).
SPRT;BGEOM message is displayed
Refer to paragraph 6-35 for message format and legal entries.
Continued on next page

6-18. PROCESSING FLOT OR CIRCULAR RFA INFORMATION USING THE SPRT;BGEOM MESSAGE - CONTINUED

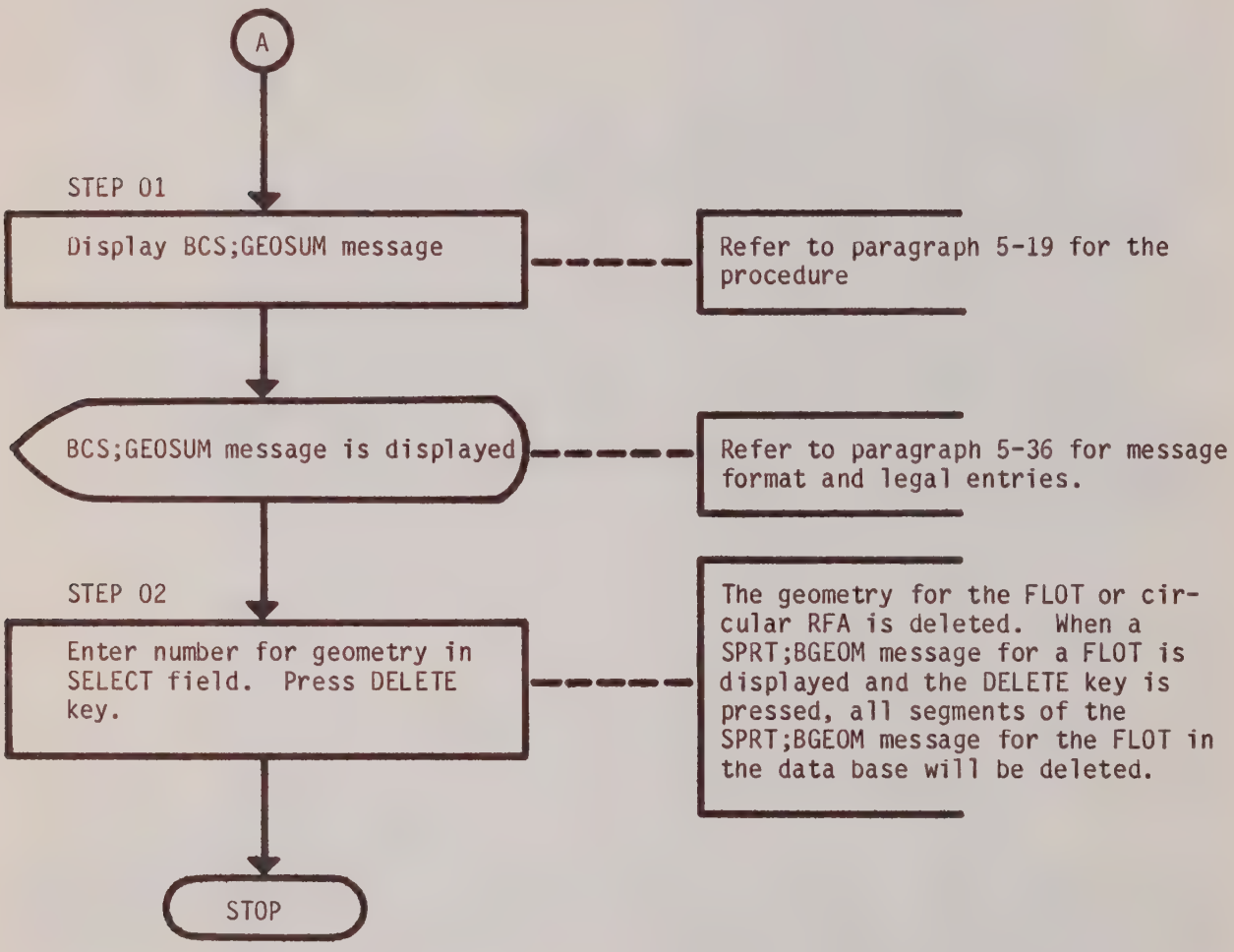

Continued from previous page
STEP 02
Enter/update/delete data as required. Press EXEC key.
When points in the FLOT are entered and the message has been executed, they cannot be deleted by using the ERASE key and reexecuting the message. New points can be added to the FLOT in the data base. Previously entered coordinates of points can be changed. When the TYPE field is FLOT and AP is blank, BCS computes the FLOT. The middle display is updated. If the executed message was for an active FLOT and the AP field contained an entry, the geometry becomes inactive. A warning message stating that the geometry is inactive is displayed. To reactivate the geometry, you must execute the segment of the SPRT;BGEOM message with no entry in AP. If an error message appears indicating a FLOT intersects, you must check other segments of the SPRT;BGEOM message for incorrect entries.
Is another segment of the SPRT;BGEOM message displayed?
NO
Are you required to enter additional points?
NO
STOP
YES
YES
Go to STEP 01
Continued on next page

6-18. PROCESSING FLOT OR CIRCULAR RFA INFORMATION USING THE SPRT;BGEOM MESSAGE - CONTINUED


Continued from previous page
Are you required to update the segment of the SPRT;BGEOM on display?
YES
Go to STEP 02
NO
Are you required to update another segment of the SPRT;BGEOM message?
NO
STOP
YES
STEP 03
Press PREV SEG or NEXT SEG key until selected segment is displayed
Selected segment of SPRT;BGEOM message is displayed
Go to STEP 02

6-18. PROCESSING FLOT OR CIRCULAR RFA INFORMATION USING THE SPRT;BGEOM MESSAGE - CONTINUED

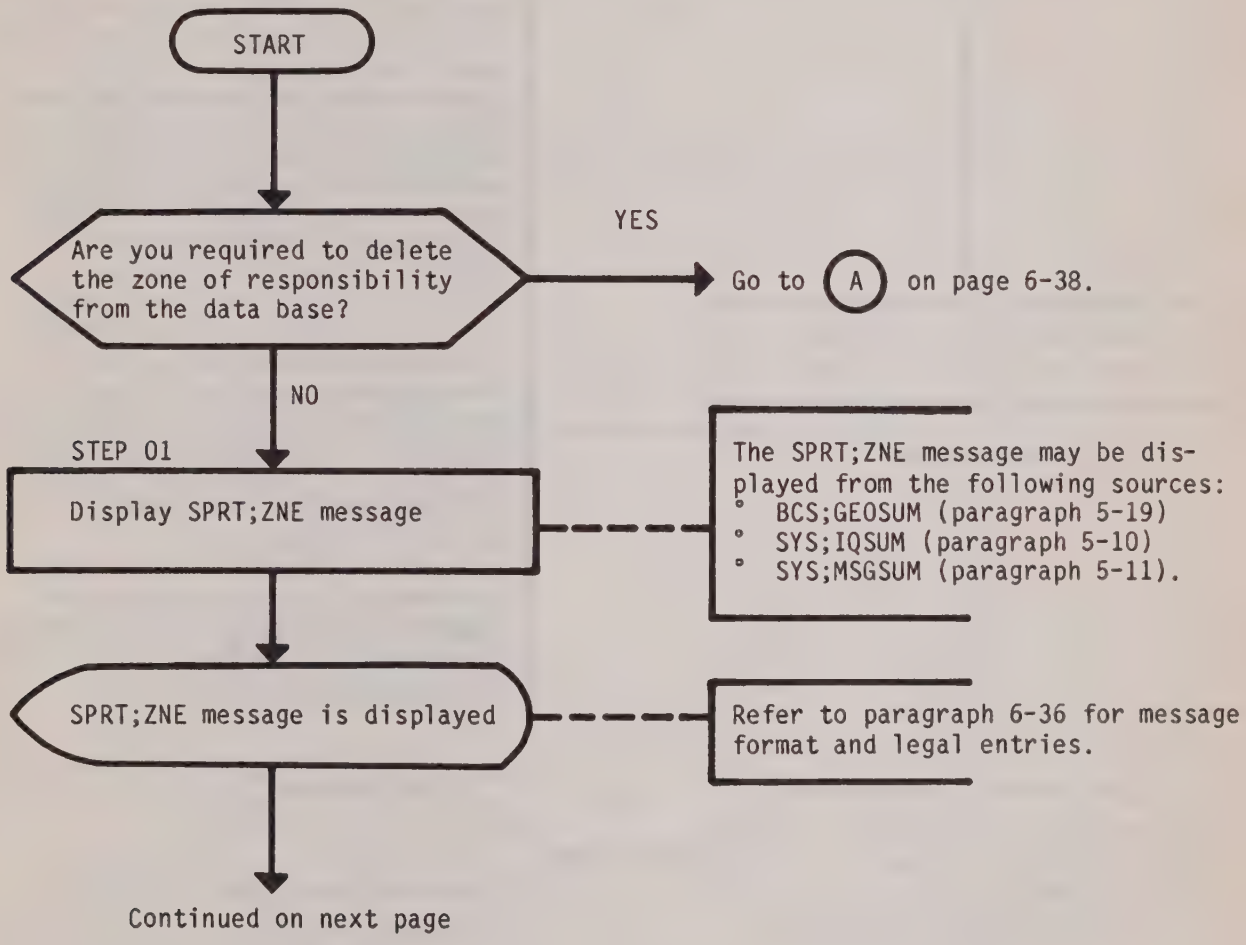
Continued from previous page


A
STEP 01
Display BCS;GEOSUM message
Refer to paragraph 5-19 for the procedure
BCS;GEOSUM message is displayed
Refer to paragraph 5-36 for message format and legal entries.
STEP 02
Enter number for geometry in SELECT field. Press DELETE key.
The geometry for the FLOT or circular RFA is deleted. When a SPRT;BGEOM message for a FLOT is displayed and the DELETE key is pressed, all segments of the SPRT;BGEOM message for the FLOT in the data base will be deleted.
STOP

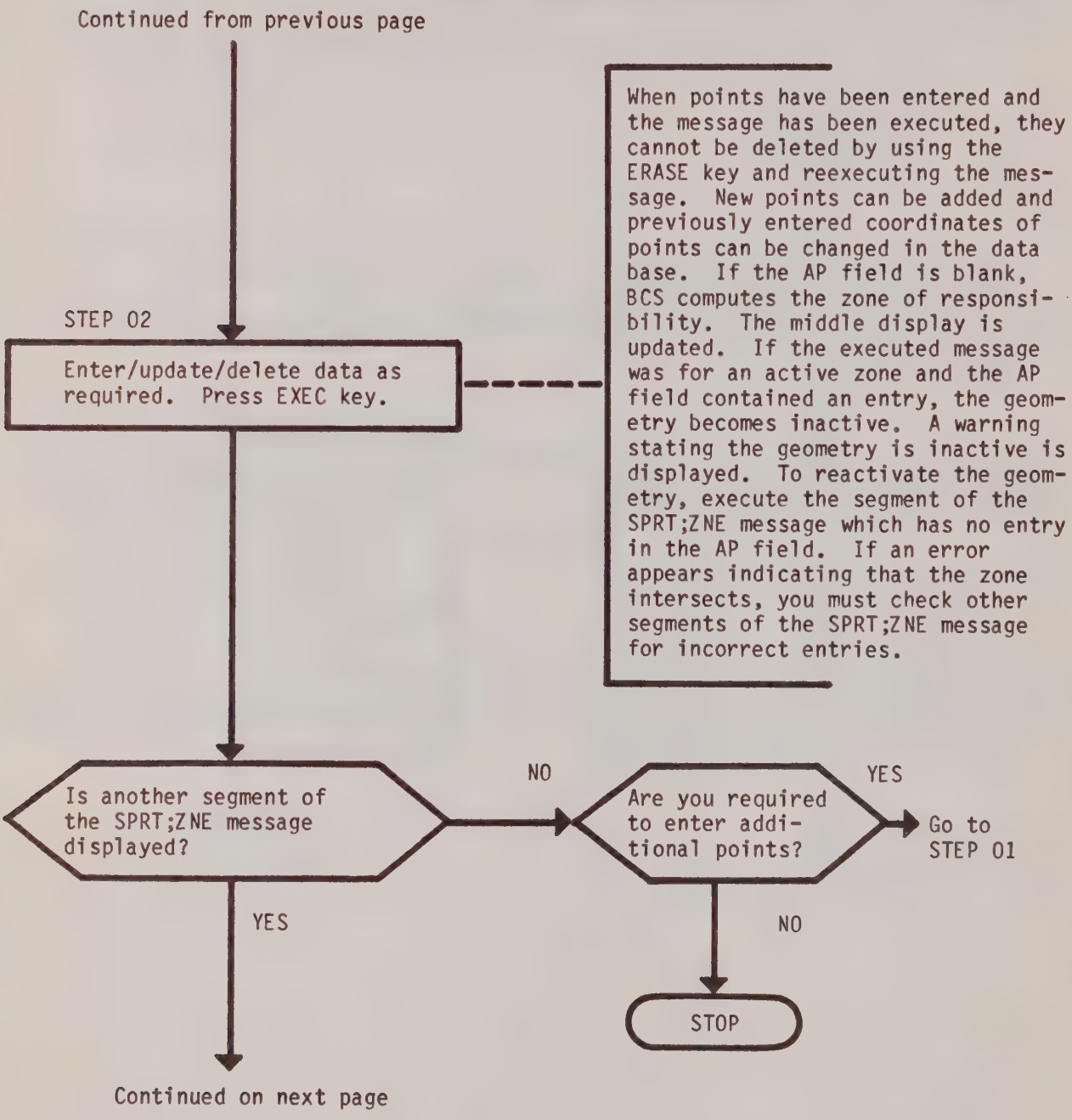
6-19. PROCESSING ZONE OF RESPONSIBILITY INFORMATION USING THE SPRT;ZNE MESSAGE

Use this flowchart to perform the following task:

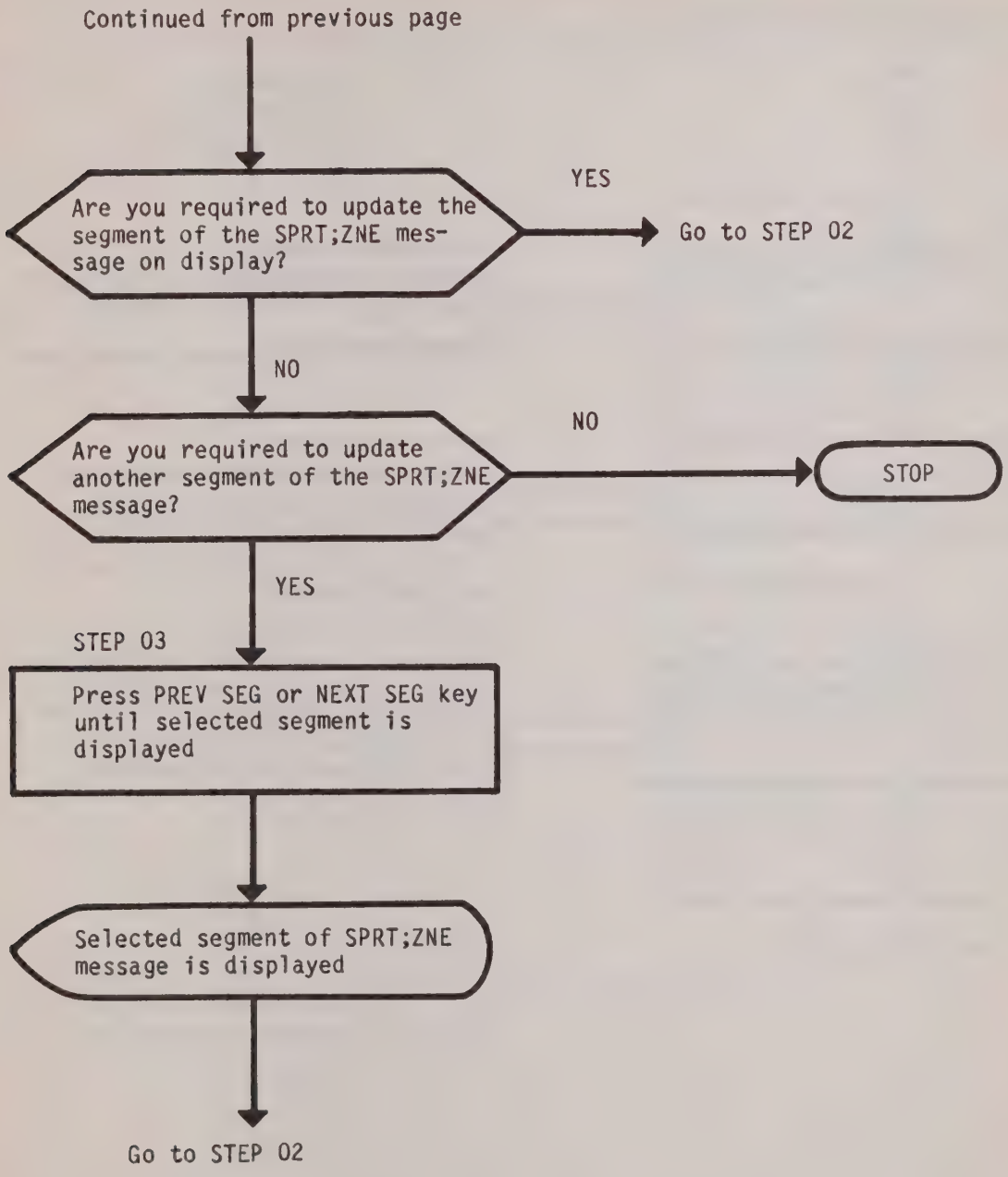
- Process Zone of Responsibility Information Using the SPRT;ZNE Message.


START
Are you required to delete the zone of responsibility from the data base?
YES
Go to (A) on page 6-38.
NO
STEP 01
Display SPRT;ZNE message
The SPRT;ZNE message may be displayed from the following sources:
° BCS;GEOSUM (paragraph 5-19)
° SYS;IQSUM (paragraph 5-10)
° SYS;MSGSUM (paragraph 5-11).
SPRT;ZNE message is displayed
Refer to paragraph 6-36 for message format and legal entries.
Continued on next page

6-19. PROCESSING ZONE OF RESPONSIBILITY INFORMATION USING THE SPRT;ZNE MESSAGE - CONTINUED

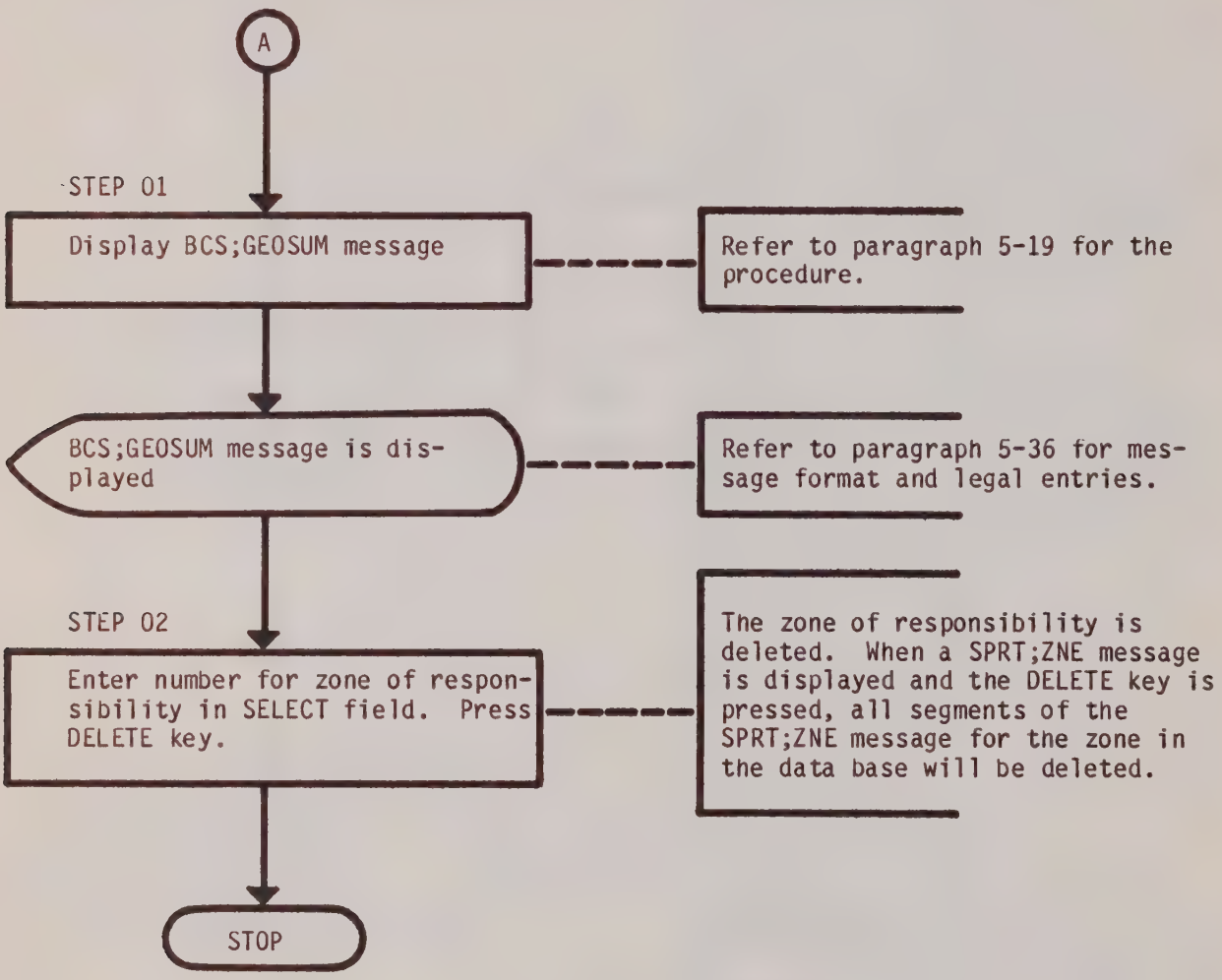

Continued from previous page
STEP 02
Enter/update/delete data as required. Press EXEC key.
When points have been entered and the message has been executed, they cannot be deleted by using the ERASE key and reexecuting the message. New points can be added and previously entered coordinates of points can be changed in the data base. If the AP field is blank, BCS computes the zone of responsibility. The middle display is updated. If the executed message was for an active zone and the AP field contained an entry, the geometry becomes inactive. A warning stating the geometry is inactive is displayed. To reactivate the geometry, execute the segment of the SPRT;ZNE message which has no entry in the AP field. If an error appears indicating that the zone intersects, you must check other segments of the SPRT;ZNE message for incorrect entries.
Is another segment of the SPRT;ZNE message displayed?
NO
Are you required to enter additional points?
YES
Go to STEP 01
YES
NO
STOP
Continued on next page

6-19. PROCESSING ZONE OF RESPONSIBILITY INFORMATION USING THE SPRT;ZNE MESSAGE - CONTINUED


Continued from previous page
Are you required to update the segment of the SPRT;ZNE message on display?
YES
Go to STEP 02
NO
Are you required to update another segment of the SPRT;ZNE message?
NO
STOP
YES
STEP 03
Press PREV SEG or NEXT SEG key until selected segment is displayed
Selected segment of SPRT;ZNE message is displayed
Go to STEP 02

6-19. PROCESSING ZONE OF RESPONSIBILITY INFORMATION USING THE SPRT;ZNE MESSAGE - CONTINUED

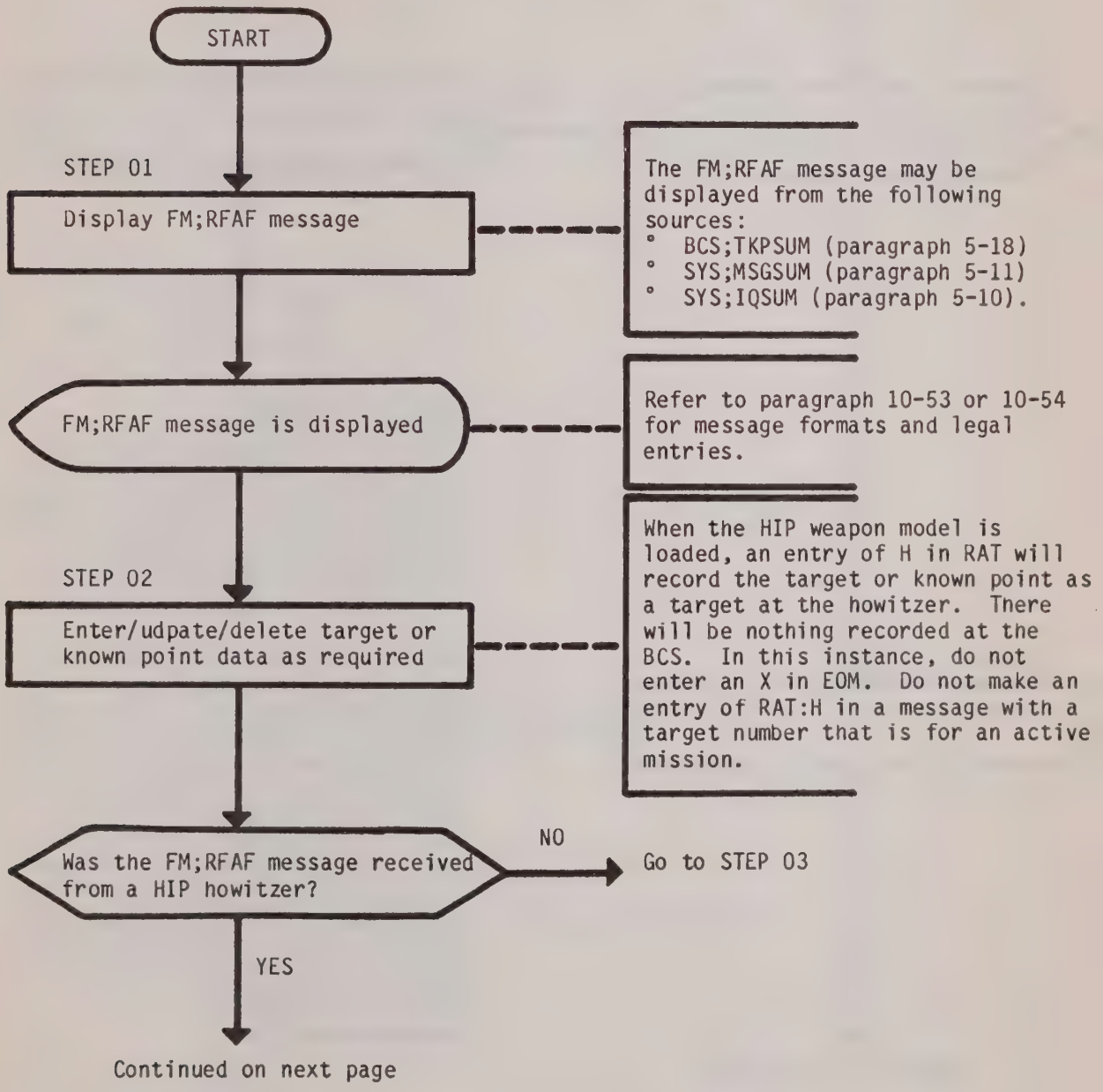
Continued from previous page


A
STEP 01
Display BCS;GEOSUM message
Refer to paragraph 5-19 for the procedure.
BCS;GEOSUM message is displayed
Refer to paragraph 5-36 for message format and legal entries.
STEP 02
Enter number for zone of responsibility in SELECT field. Press DELETE key.
The zone of responsibility is deleted. When a SPRT;ZNE message is displayed and the DELETE key is pressed, all segments of the SPRT;ZNE message for the zone in the data base will be deleted.
STOP

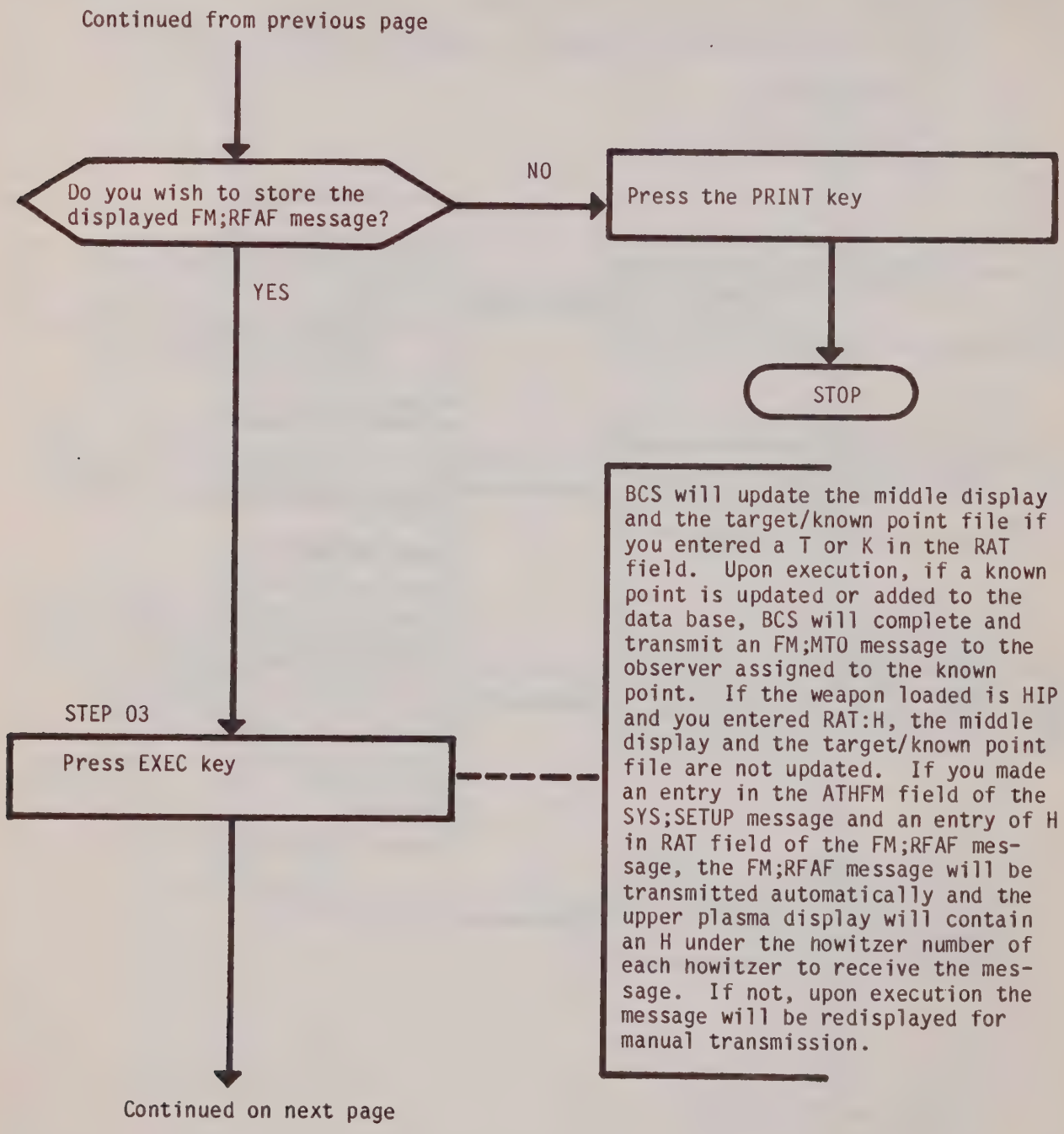
6-20. PROCESSING TARGET/KNOWN POINT INFORMATION USING THE FM;RFAF MESSAGE

Use this flowchart to perform the following task:

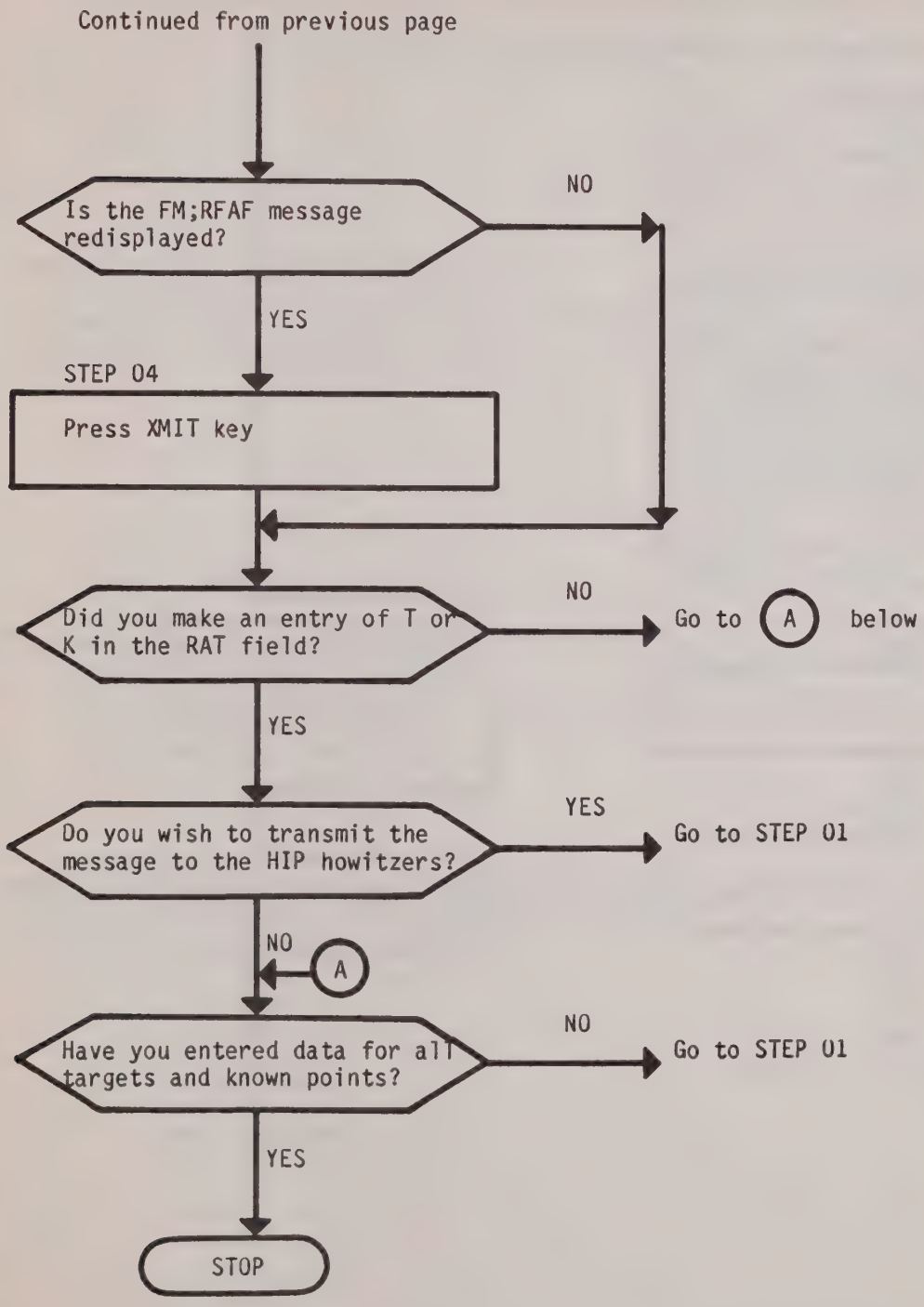
° Process Target/Known Point Information Using the FM;RFAF Message.


START
STEP 01
Display FM;RFAF message
The FM;RFAF message may be displayed from the following sources:
° BCS;TKPSUM (paragraph 5-18)
° SYS;MSGSUM (paragraph 5-11)
° SYS;IQSUM (paragraph 5-10).
FM;RFAF message is displayed
Refer to paragraph 10-53 or 10-54 for message formats and legal entries.
STEP 02
Enter/udpate/delete target or known point data as required
When the HIP weapon model is loaded, an entry of H in RAT will record the target or known point as a target at the howitzer. There will be nothing recorded at the BCS. In this instance, do not enter an X in EOM. Do not make an entry of RAT:H in a message with a target number that is for an active mission.
Was the FM;RFAF message received from a HIP howitzer?
NO
Go to STEP 03
YES
Continued on next page

6-20. PROCESSING TARGET/KNOWN POINT INFORMATION USING THE FM;RFAF MESSAGE - CONTINUED


Continued from previous page
Do you wish to store the displayed FM;RFAF message?
NO
Press the PRINT key
STOP
YES
STEP 03
Press EXEC key
BCS will update the middle display and the target/known point file if you entered a T or K in the RAT field. Upon execution, if a known point is updated or added to the data base, BCS will complete and transmit an FM;MTO message to the observer assigned to the known point. If the weapon loaded is HIP and you entered RAT:H, the middle display and the target/known point file are not updated. If you made an entry in the ATHFM field of the SYS;SETUP message and an entry of H in RAT field of the FM;RFAF message, the FM;RFAF message will be transmitted automatically and the upper plasma display will contain an H under the howitzer number of each howitzer to receive the message. If not, upon execution the message will be redisplayed for manual transmission.
Continued on next page

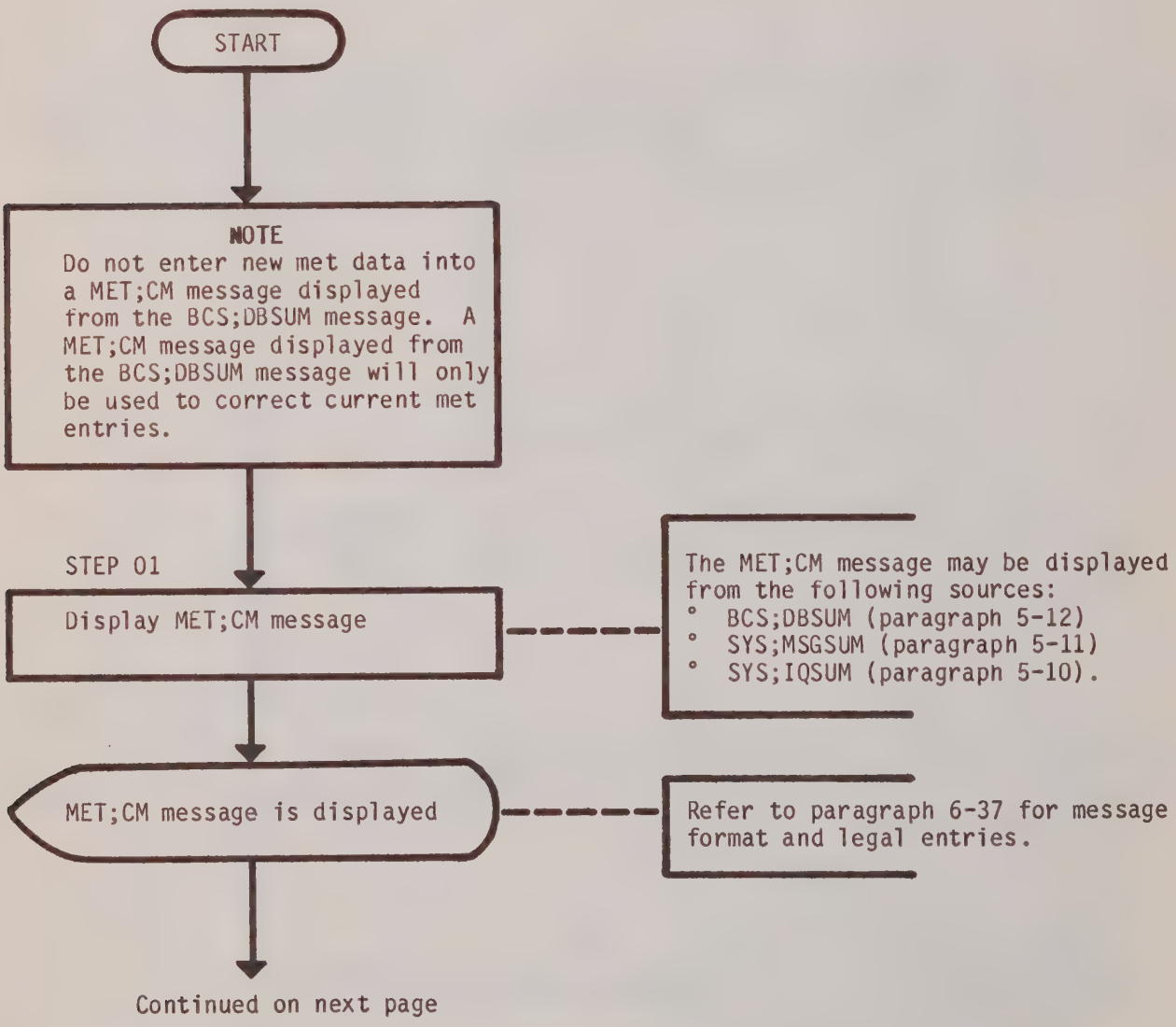
6-20. PROCESSING TARGET/KNOWN POINT INFORMATION USING THE FM;RFAF MESSAGE - CONTINUED



6-21. PROCESSING METEOROLOGICAL INFORMATION USING THE MET;CM MESSAGE

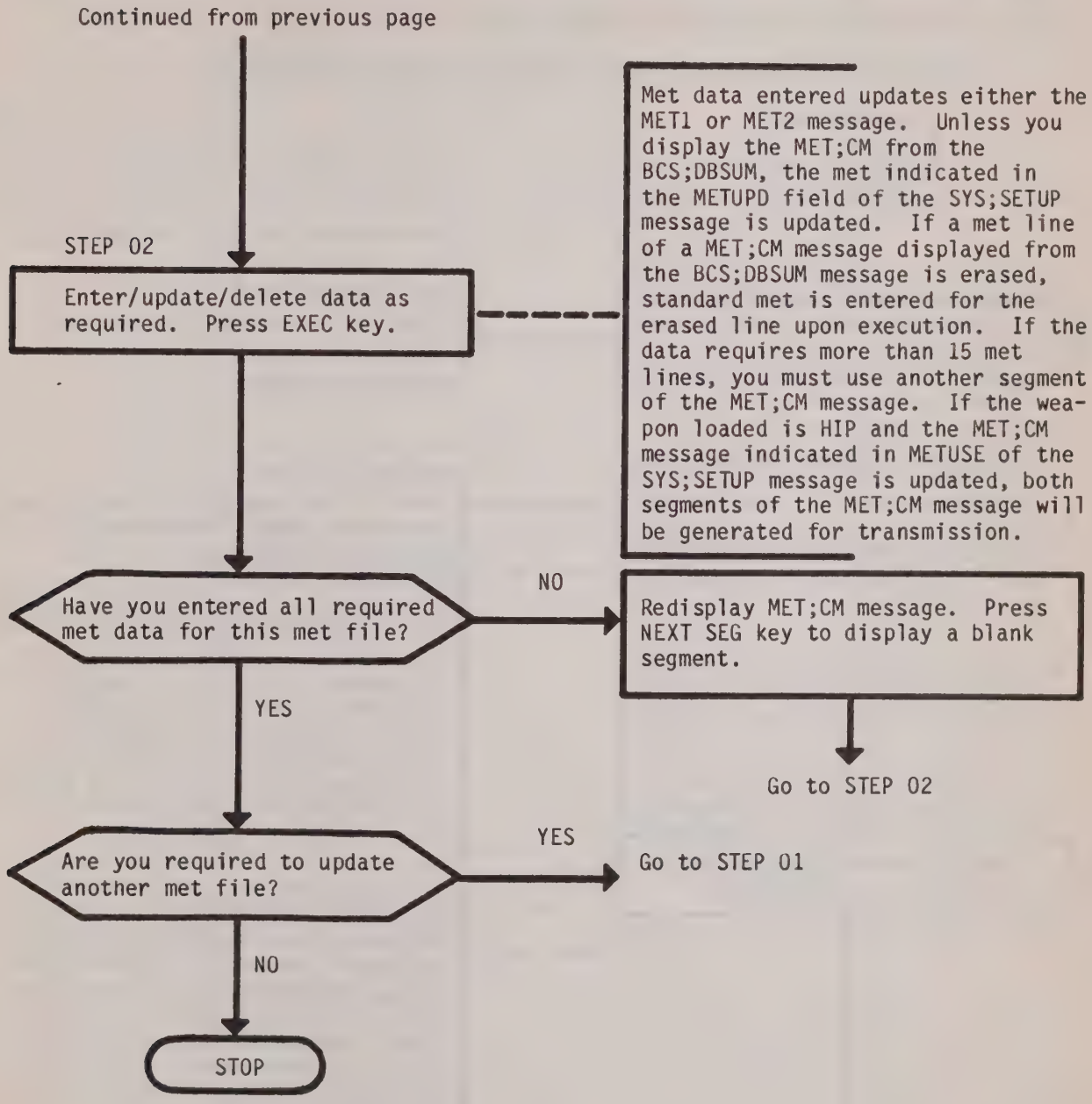
Use this flowchart to perform the following task:

- Process Meteorological Information Using the MET;CM Message.


START
NOTE
Do not enter new met data into a MET;CM message displayed from the BCS;DBSUM message. A MET;CM message displayed from the BCS;DBSUM message will only be used to correct current met entries.
STEP 01
Display MET;CM message
The MET;CM message may be displayed from the following sources:
° BCS;DBSUM (paragraph 5-12)
° SYS;MSGSUM (paragraph 5-11)
° SYS;IQSUM (paragraph 5-10).
MET;CM message is displayed
Refer to paragraph 6-37 for message format and legal entries.

Continued on next page

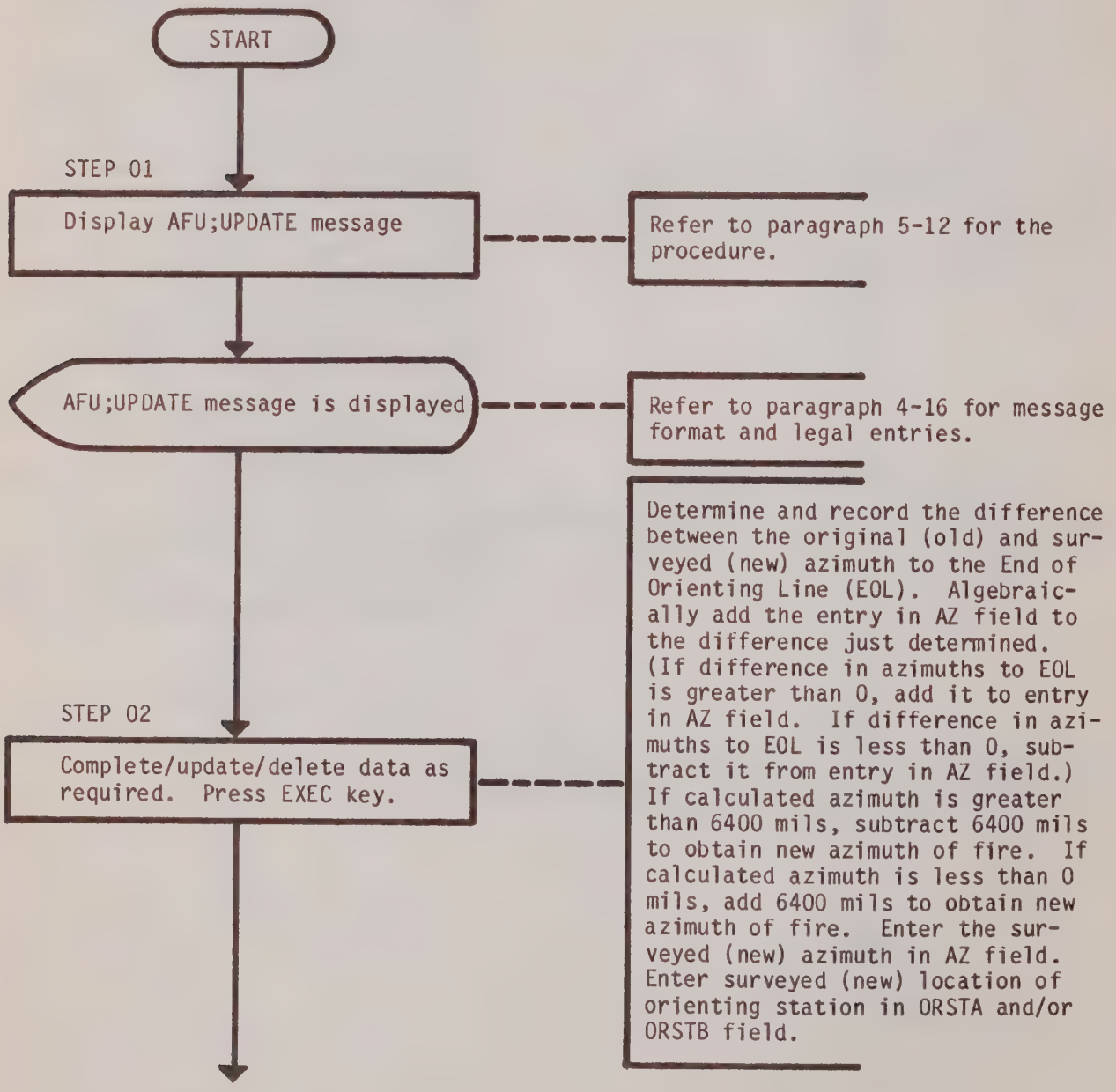
6-21. PROCESSING METEOROLOGICAL INFORMATION USING THE MET;CM MESSAGE - CONTINUED


Continued from previous page
STEP 02
Enter/update/delete data as required. Press EXEC key.
Met data entered updates either the MET1 or MET2 message. Unless you display the MET;CM from the BCS;DBSUM, the met indicated in the METUPD field of the SYS;SETUP message is updated. If a met line of a MET;CM message displayed from the BCS;DBSUM message is erased, standard met is entered for the erased line upon execution. If the data requires more than 15 met lines, you must use another segment of the MET;CM message. If the weapon loaded is HIP and the MET;CM message indicated in METUSE of the SYS;SETUP message is updated, both segments of the MET;CM message will be generated for transmission.
Have you entered all required met data for this met file?
NO
Redisplay MET;CM message. Press NEXT SEG key to display a blank segment.
Go to STEP 02
YES
Are you required to update another met file?
YES
Go to STEP 01
NO
STOP

6-22. UPDATING FIRE UNIT LOCATION USING SURVEY INFORMATION (NON-HIP)

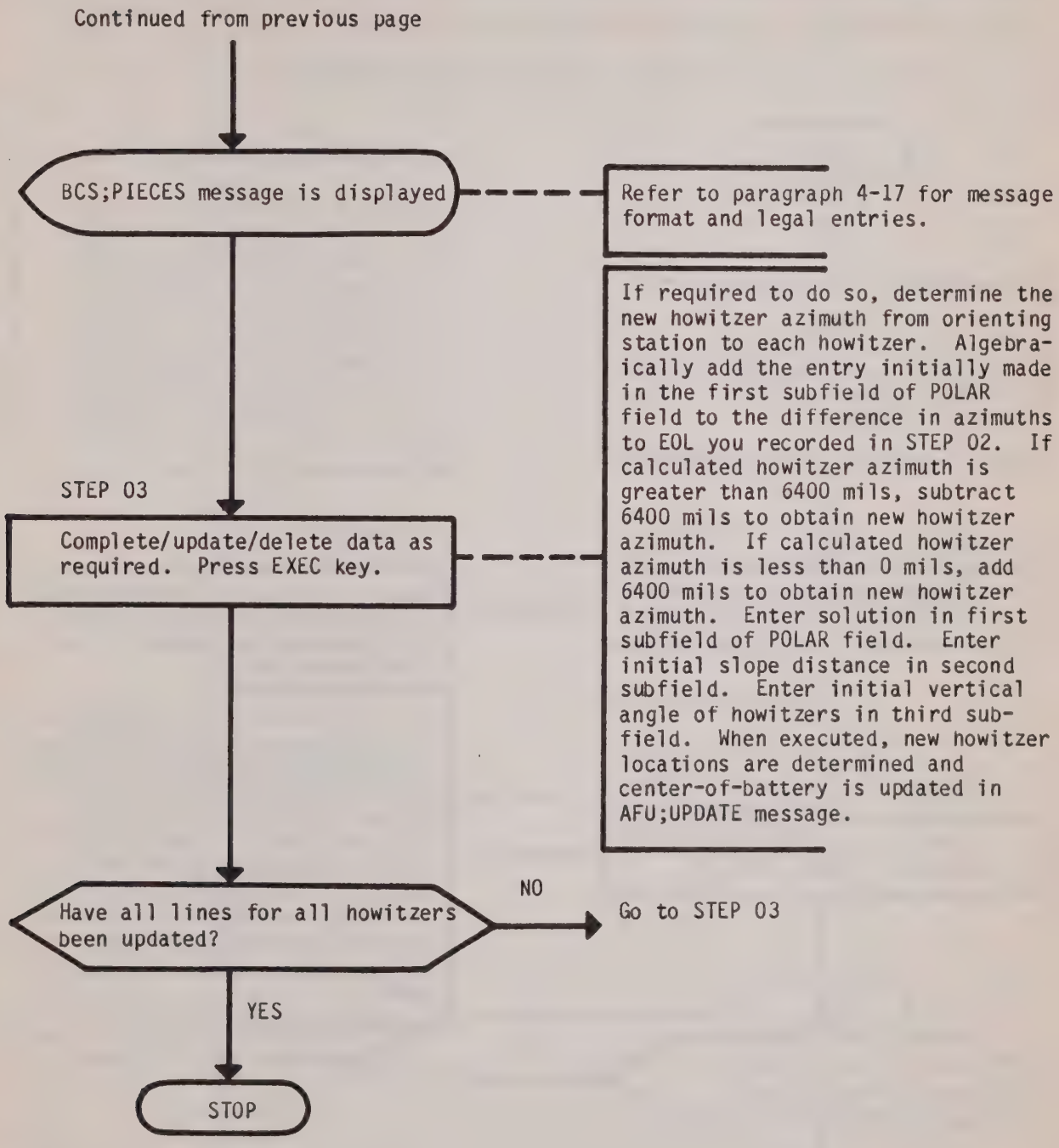
Use this flowchart to perform the following task:

- Update Fire Unit Location Using Survey Information (Non-HIP).


START
STEP 01
Display AFU;UPDATE message
Refer to paragraph 5-12 for the procedure.
AFU;UPDATE message is displayed
Refer to paragraph 4-16 for message format and legal entries.
STEP 02
Complete/update/delete data as required. Press EXEC key.
Determine and record the difference between the original (old) and surveyed (new) azimuth to the End of Orienting Line (EOL). Algebraically add the entry in AZ field to the difference just determined. (If difference in azimuths to EOL is greater than 0, add it to entry in AZ field. If difference in azimuths to EOL is less than 0, subtract it from entry in AZ field.) If calculated azimuth is greater than 6400 mils, subtract 6400 mils to obtain new azimuth of fire. If calculated azimuth is less than 0 mils, add 6400 mils to obtain new azimuth of fire. Enter the surveyed (new) azimuth in AZ field. Enter surveyed (new) location of orienting station in ORSTA and/or ORSTB field.

Continued on next page

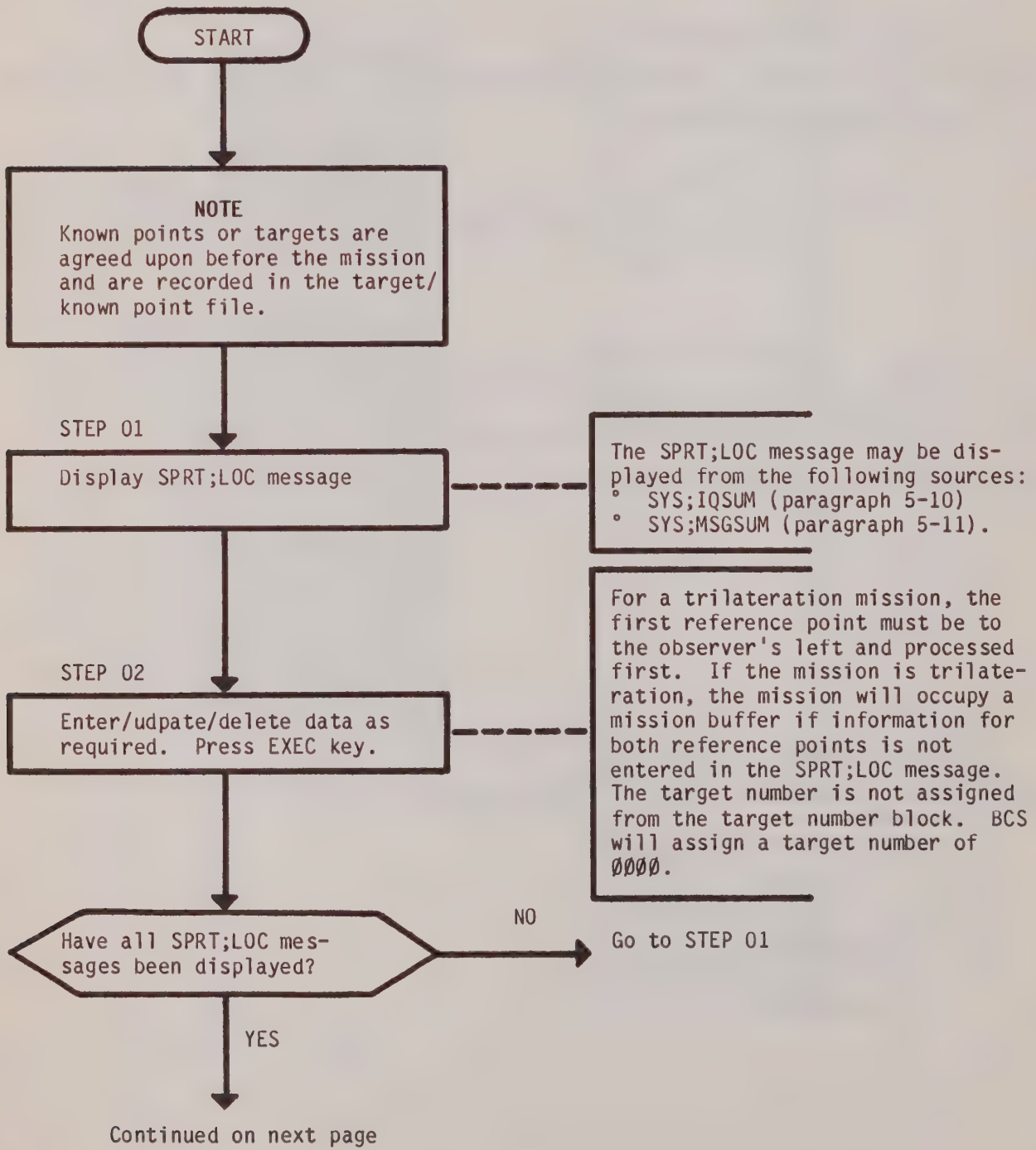
6-22. UPDATING FIRE UNIT LOCATION USING SURVEY INFORMATION (NON-HIP) - CONTINUED


Continued from previous page
BCS;PIECES message is displayed
Refer to paragraph 4-17 for message format and legal entries.
STEP 03
Complete/update/delete data as required. Press EXEC key.
If required to do so, determine the new howitzer azimuth from orienting station to each howitzer. Algebraically add the entry initially made in the first subfield of POLAR field to the difference in azimuths to EOL you recorded in STEP 02. If calculated howitzer azimuth is greater than 6400 mils, subtract 6400 mils to obtain new howitzer azimuth. If calculated howitzer azimuth is less than 0 mils, add 6400 mils to obtain new howitzer azimuth. Enter solution in first subfield of POLAR field. Enter initial slope distance in second subfield. Enter initial vertical angle of howitzers in third subfield. When executed, new howitzer locations are determined and center-of-battery is updated in AFU;UPDATE message.
Have all lines for all howitzers been updated?
NO
Go to STEP 03
YES
STOP

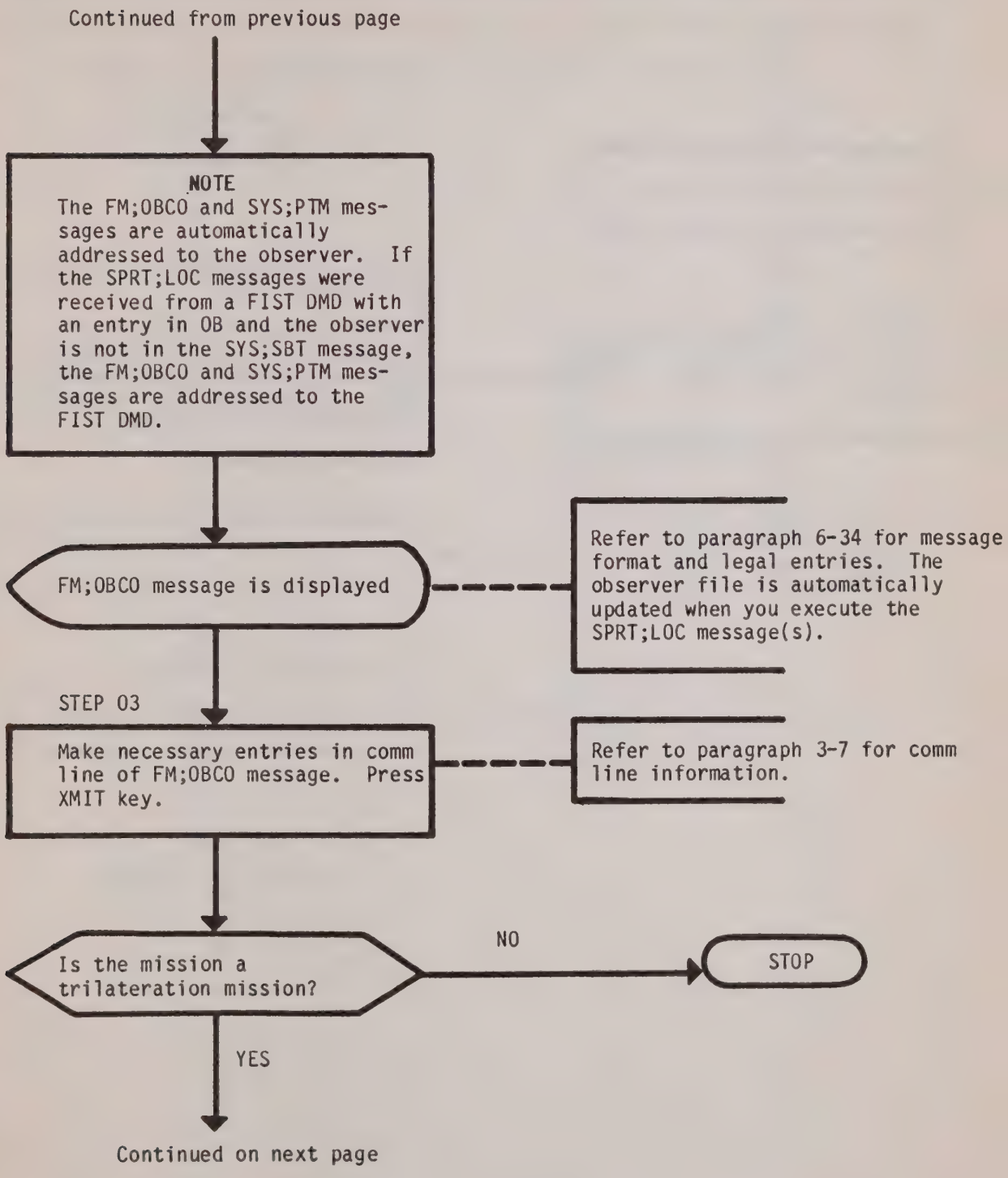
6-23. CALCULATING OBSERVER LOCATION USING THE SPRT;LOC MESSAGE

Use this flowchart to perform the following task:

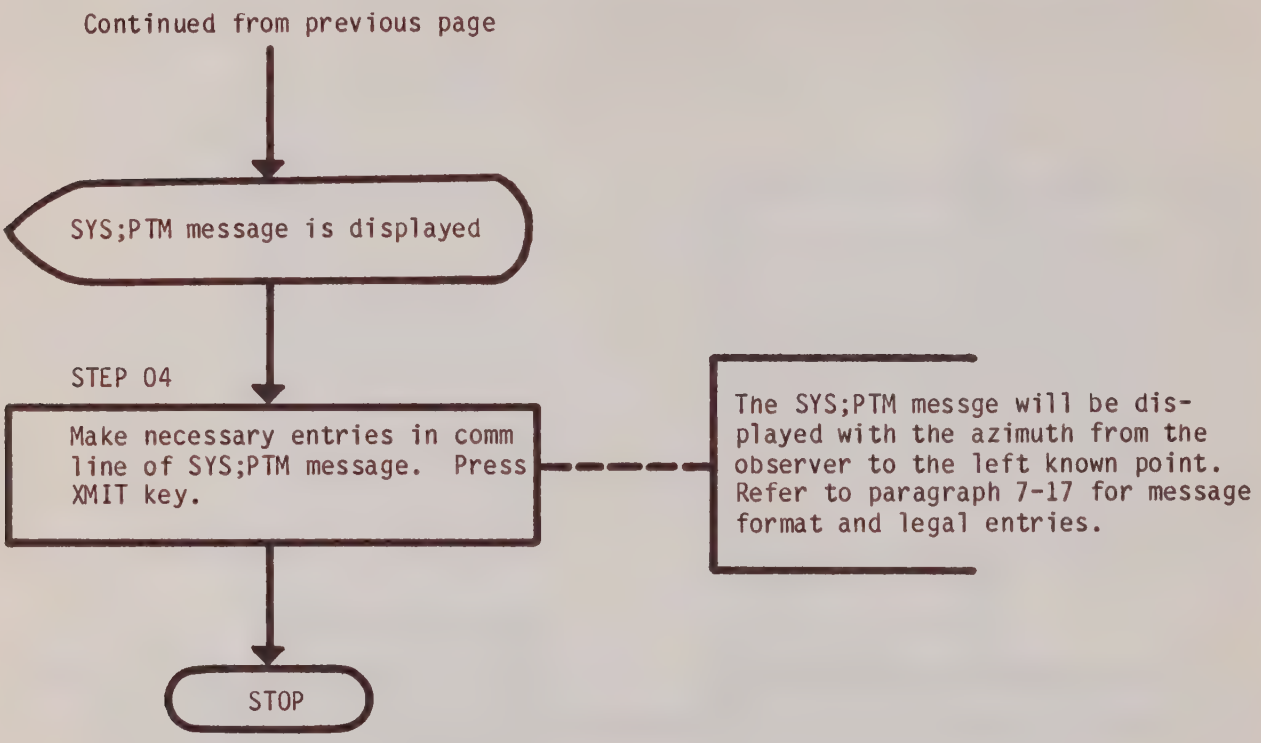
- Calculate Observer Location Using the SPRT;LOC message.


START
NOTE
Known points or targets are agreed upon before the mission and are recorded in the target/known point file.
STEP 01
Display SPRT;LOC message
The SPRT;LOC message may be displayed from the following sources:
° SYS;IQSUM (paragraph 5-10)
° SYS;MSGSUM (paragraph 5-11).
STEP 02
Enter/udpate/delete data as required. Press EXEC key.
For a trilateration mission, the first reference point must be to the observer's left and processed first. If the mission is trilateration, the mission will occupy a mission buffer if information for both reference points is not entered in the SPRT;LOC message. The target number is not assigned from the target number block. BCS will assign a target number of ØØØØ.
Have all SPRT;LOC messages been displayed?
NO
Go to STEP 01
YES
Continued on next page

6-23. CALCULATING OBSERVER LOCATION USING THE SPRT;LOC MESSAGE - CONTINUED


Continued from previous page
NOTE
The FM;OBCO and SYS;PTM messages are automatically addressed to the observer. If the SPRT;LOC messages were received from a FIST DMD with an entry in OB and the observer is not in the SYS;SBT message, the FM;OBCO and SYS;PTM messages are addressed to the FIST DMD.
FM;OBCO message is displayed
Refer to paragraph 6-34 for message format and legal entries. The observer file is automatically updated when you execute the SPRT;LOC message(s).
STEP 03
Make necessary entries in comm line of FM;OBCO message. Press XMIT key.
Refer to paragraph 3-7 for comm line information.
Is the mission a trilateration mission?
NO
STOP
YES
Continued on next page

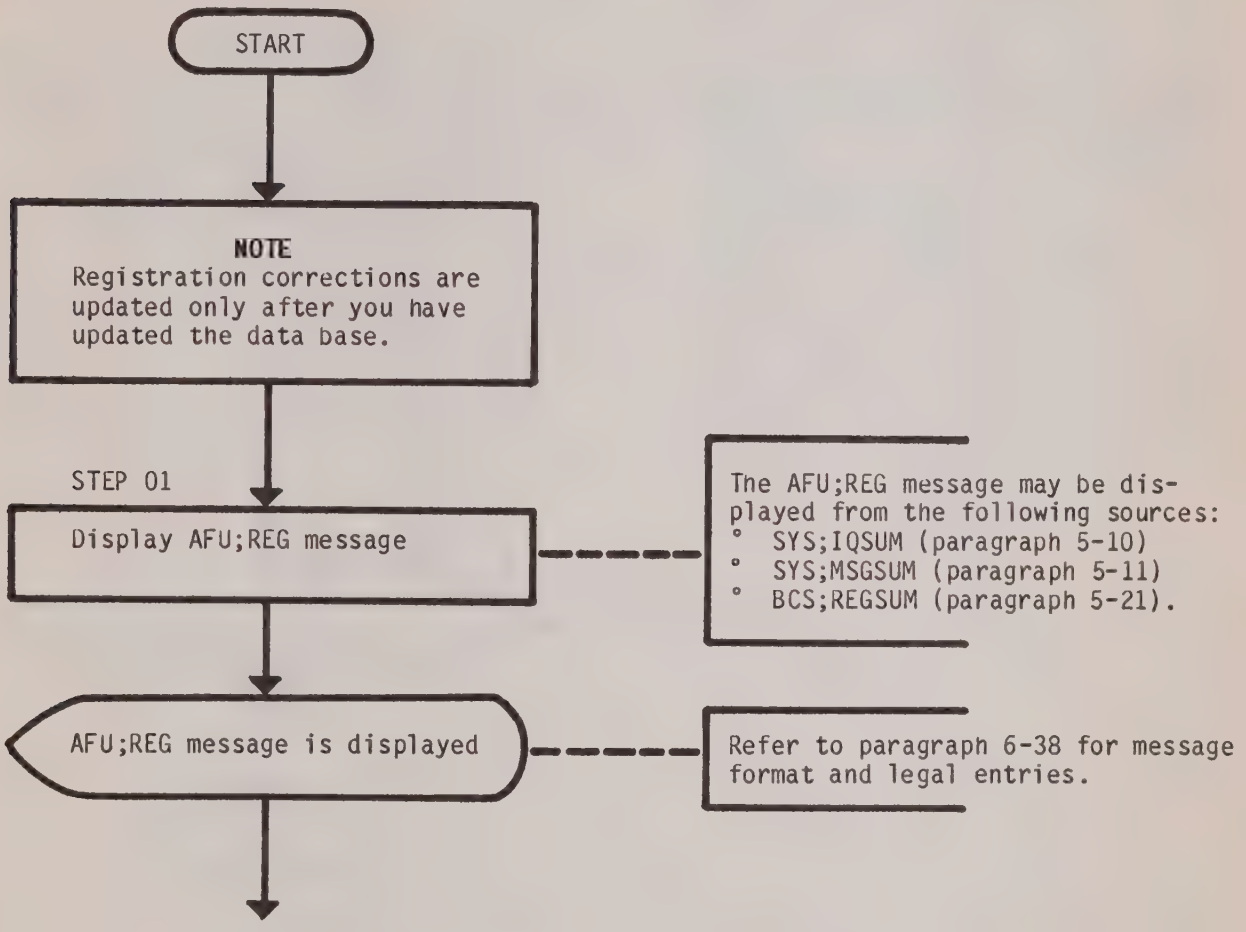
6-23. CALCULATING OBSERVER LOCATION USING THE SPRT;LOC MESSAGE - CONTINUED


Continued from previous page
SYS;PTM message is displayed
STEP 04
Make necessary entries in comm line of SYS;PTM message. Press XMIT key.
The SYS;PTM messge will be displayed with the azimuth from the observer to the left known point. Refer to paragraph 7-17 for message format and legal entries.
STOP

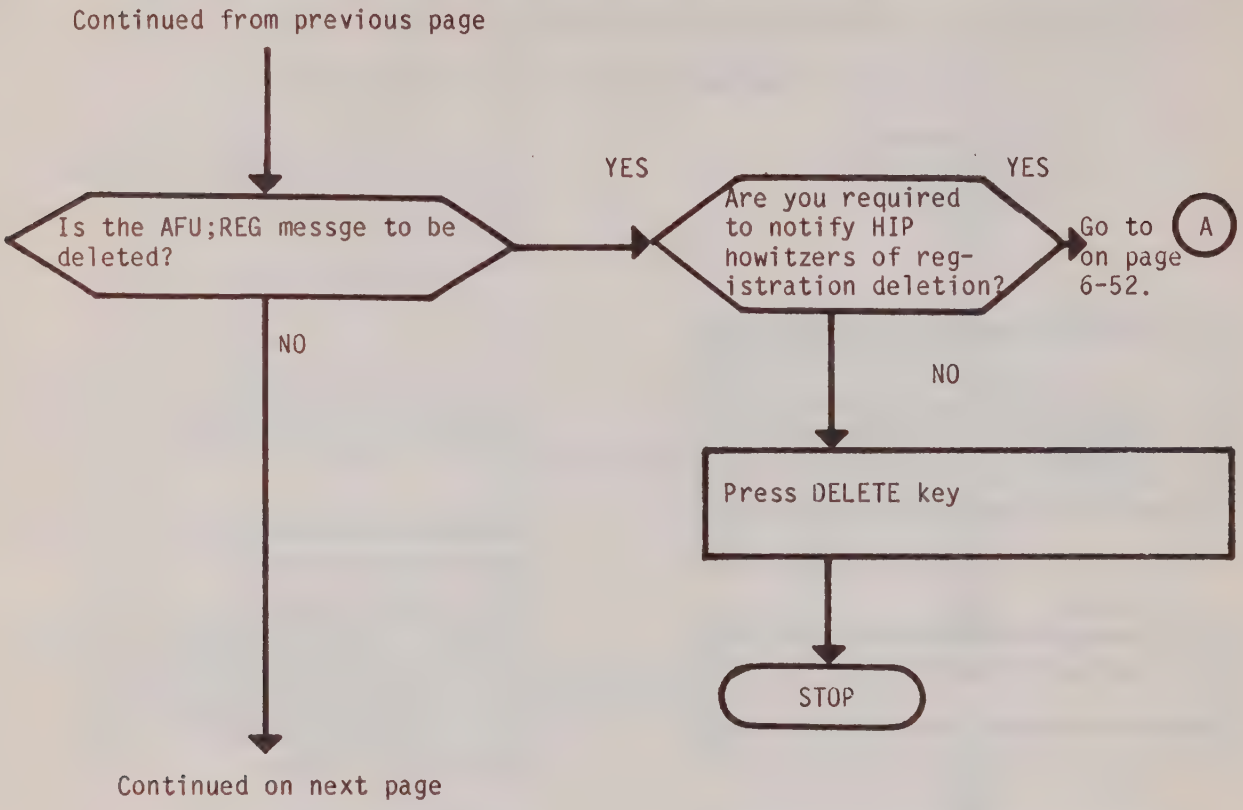
6-24. PROCESSING REGISTRATION INFORMATION USING THE AFU;REG MESSAGE

Use this flowchart to perform the following task:

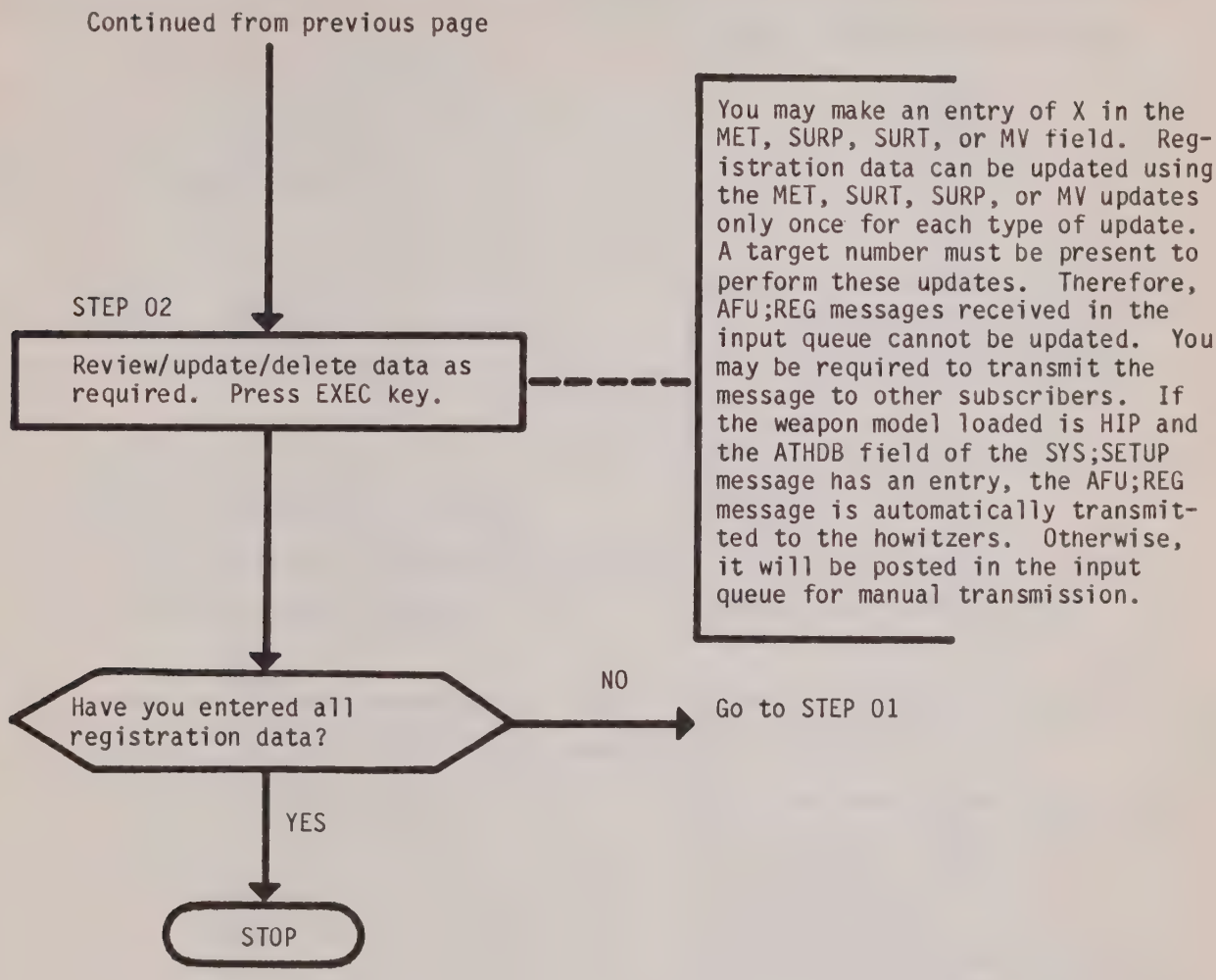
- Process Registration Information Using the AFU;REG Message.


START
NOTE
Registration corrections are updated only after you have updated the data base.
STEP 01
Display AFU;REG message
The AFU;REG message may be displayed from the following sources:
° SYS;IQSUM (paragraph 5-10)
° SYS;MSGSUM (paragraph 5-11)
° BCS;REGSUM (paragraph 5-21).
AFU;REG message is displayed
Refer to paragraph 6-38 for message format and legal entries.
Continued on next page

6-24. PROCESSING REGISTRATION INFORMATION USING THE AFU;REG MESSAGE - CONTINUED

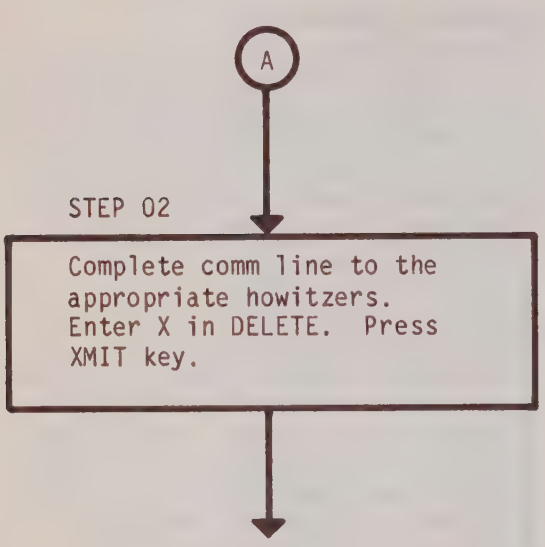


6-24. PROCESSING REGISTRATION INFORMATION USING THE AFU;REG MESSAGE - CONTINUED


Continued from previous page
STEP 02
Review/update/delete data as required. Press EXEC key.
You may make an entry of X in the MET, SURP, SURT, or MV field. Registration data can be updated using the MET, SURT, SURP, or MV updates only once for each type of update. A target number must be present to perform these updates. Therefore, AFU;REG messages received in the input queue cannot be updated. You may be required to transmit the message to other subscribers. If the weapon model loaded is HIP and the ATHDB field of the SYS;SETUP message has an entry, the AFU;REG message is automatically transmitted to the howitzers. Otherwise, it will be posted in the input queue for manual transmission.
Have you entered all registration data?
NO
Go to STEP 01
YES
STOP

6-24. PROCESSING REGISTRATION INFORMATION USING THE AFU;REG MESSAGE - CONTINUED

Continued from previous page

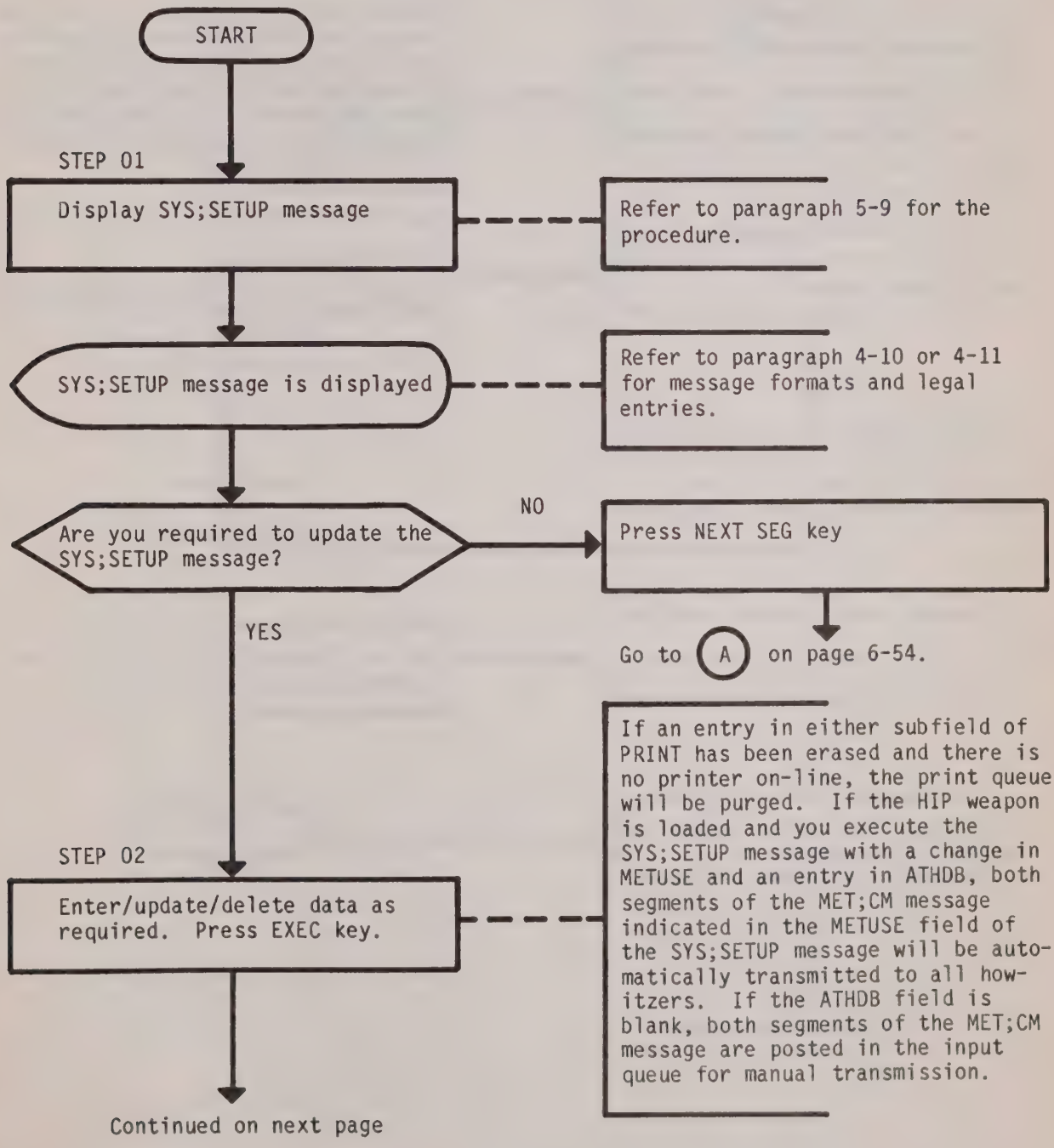


Go to STEP 01 on page 6-49.

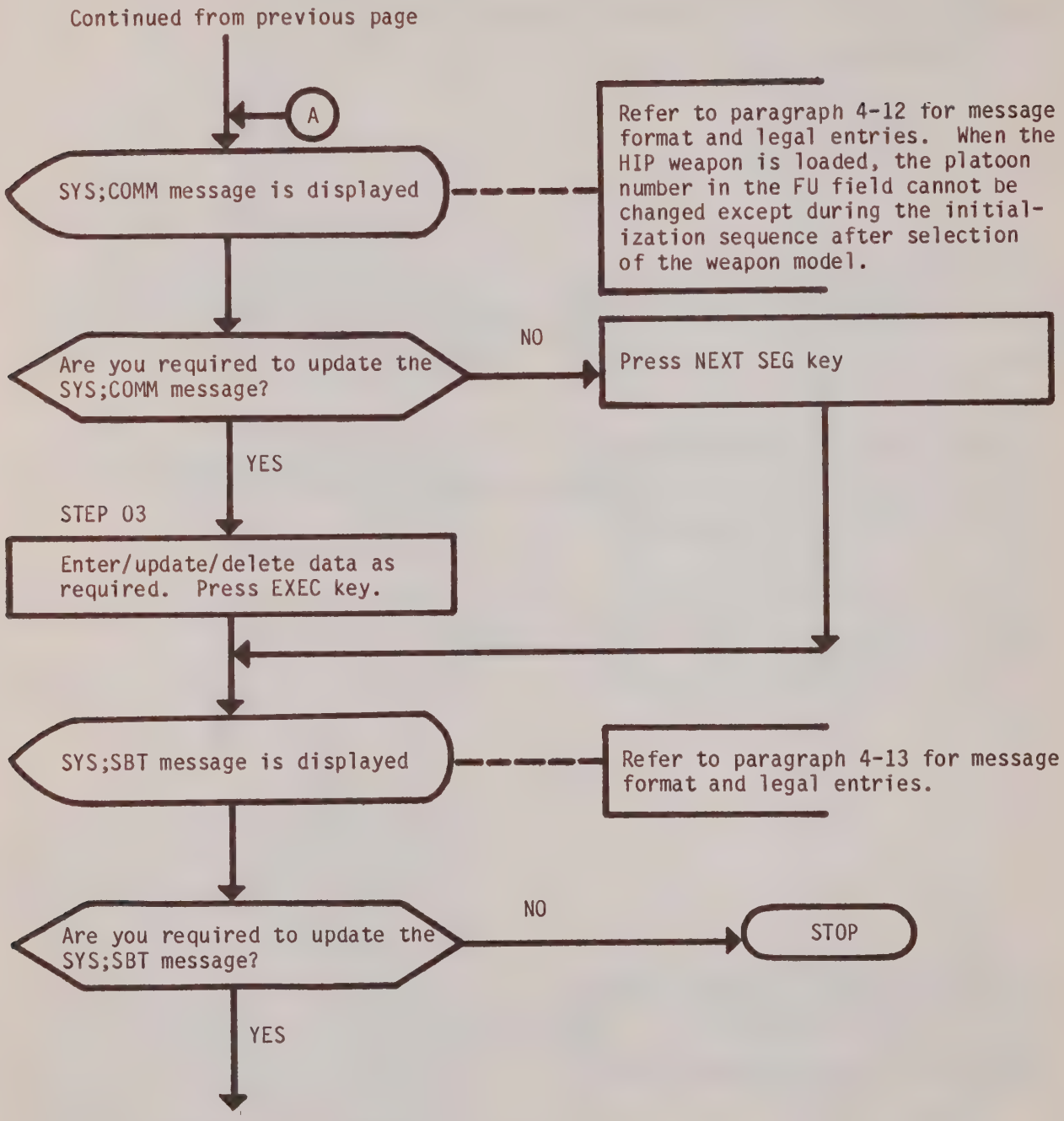
6-25. UPDATING INITIALIZATION DATA

Use this flowchart to perform the following task:

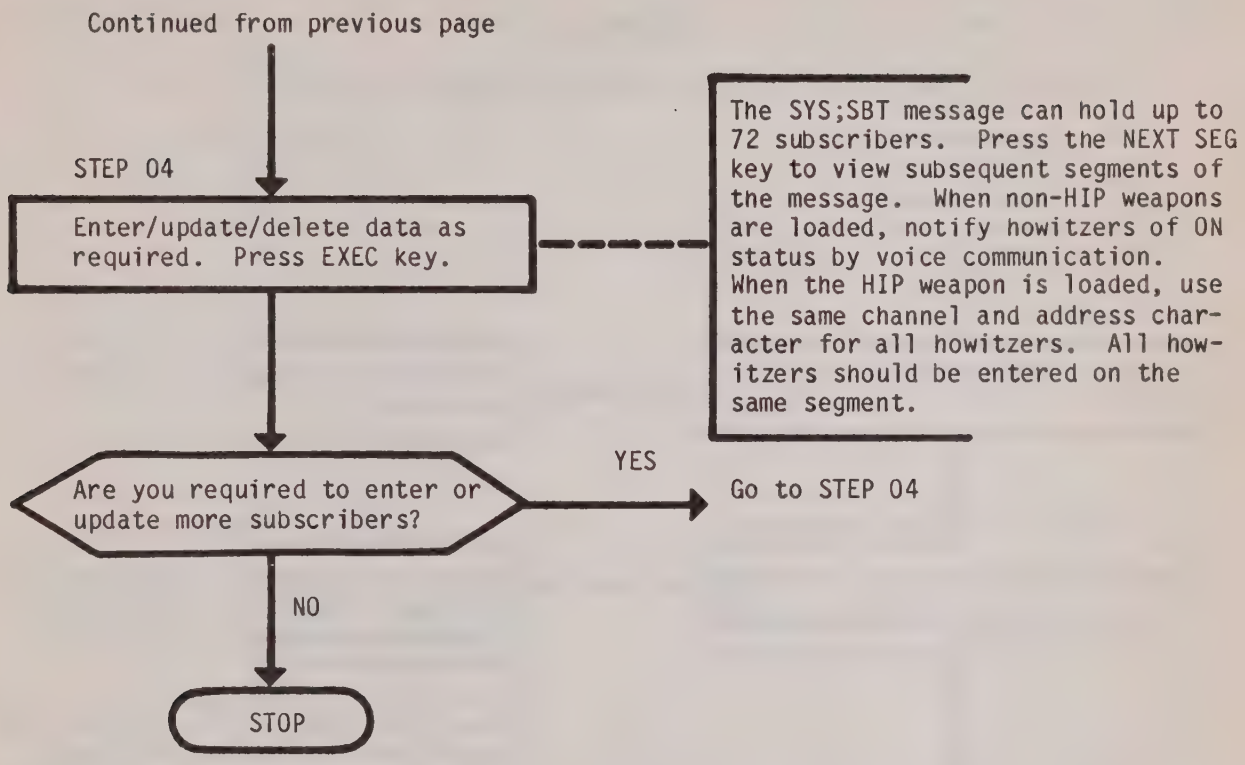
- Update Initialization Data.


START
STEP 01
Display SYS;SETUP message
Refer to paragraph 5-9 for the procedure.
SYS;SETUP message is displayed
Refer to paragraph 4-10 or 4-11 for message formats and legal entries.
Are you required to update the SYS;SETUP message?
NO
Press NEXT SEG key
Go to (A) on page 6-54.
YES
STEP 02
Enter/update/delete data as required. Press EXEC key.
If an entry in either subfield of PRINT has been erased and there is no printer on-line, the print queue will be purged. If the HIP weapon is loaded and you execute the SYS;SETUP message with a change in METUSE and an entry in ATHDB, both segments of the MET;CM message indicated in the METUSE field of the SYS;SETUP message will be automatically transmitted to all howitzers. If the ATHDB field is blank, both segments of the MET;CM message are posted in the input queue for manual transmission.
Continued on next page

6-25. UPDATING INITIALIZATION DATA - CONTINUED


Continued from previous page
A
SYS;COMM message is displayed
Refer to paragraph 4-12 for message format and legal entries. When the HIP weapon is loaded, the platoon number in the FU field cannot be changed except during the initialization sequence after selection of the weapon model.
Are you required to update the SYS;COMM message?
NO
Press NEXT SEG key
YES
STEP 03
Enter/update/delete data as required. Press EXEC key.
SYS;SBT message is displayed
Refer to paragraph 4-13 for message format and legal entries.
Are you required to update the SYS;SBT message?
NO
STOP
YES
Continued on next page

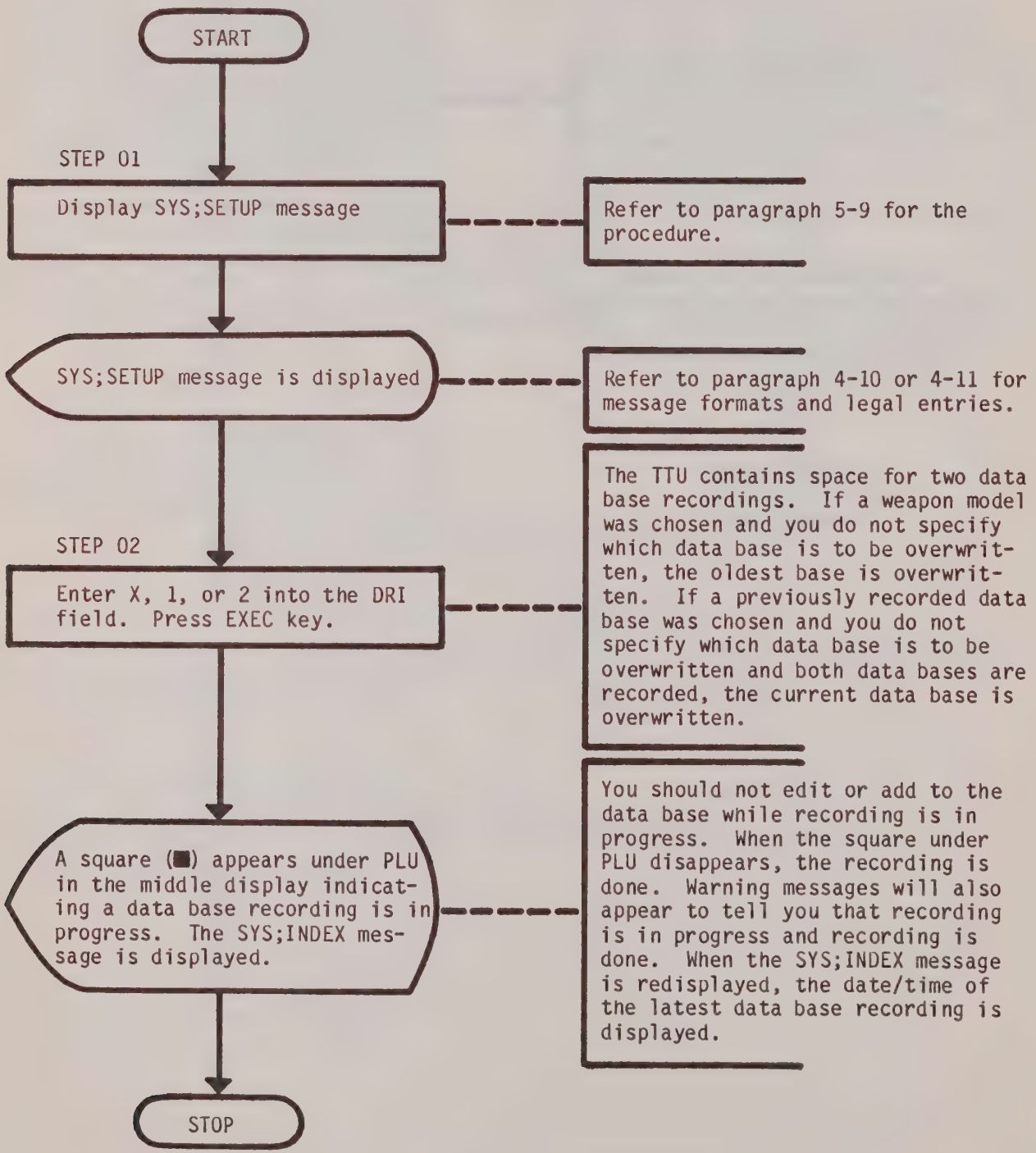
6-25. UPDATING INITIALIZATION DATA - CONTINUED


Continued from previous page
STEP 04
Enter/update/delete data as required. Press EXEC key.
The SYS;SBT message can hold up to 72 subscribers. Press the NEXT SEG key to view subsequent segments of the message. When non-HIP weapons are loaded, notify howitzers of ON status by voice communication. When the HIP weapon is loaded, use the same channel and address character for all howitzers. All howitzers should be entered on the same segment.
Are you required to enter or update more subscribers?
YES
Go to STEP 04
NO
STOP

6-26. RECORDING A DATA BASE USING THE SYS;SETUP MESSAGE

Use this flowchart to perform the following task:

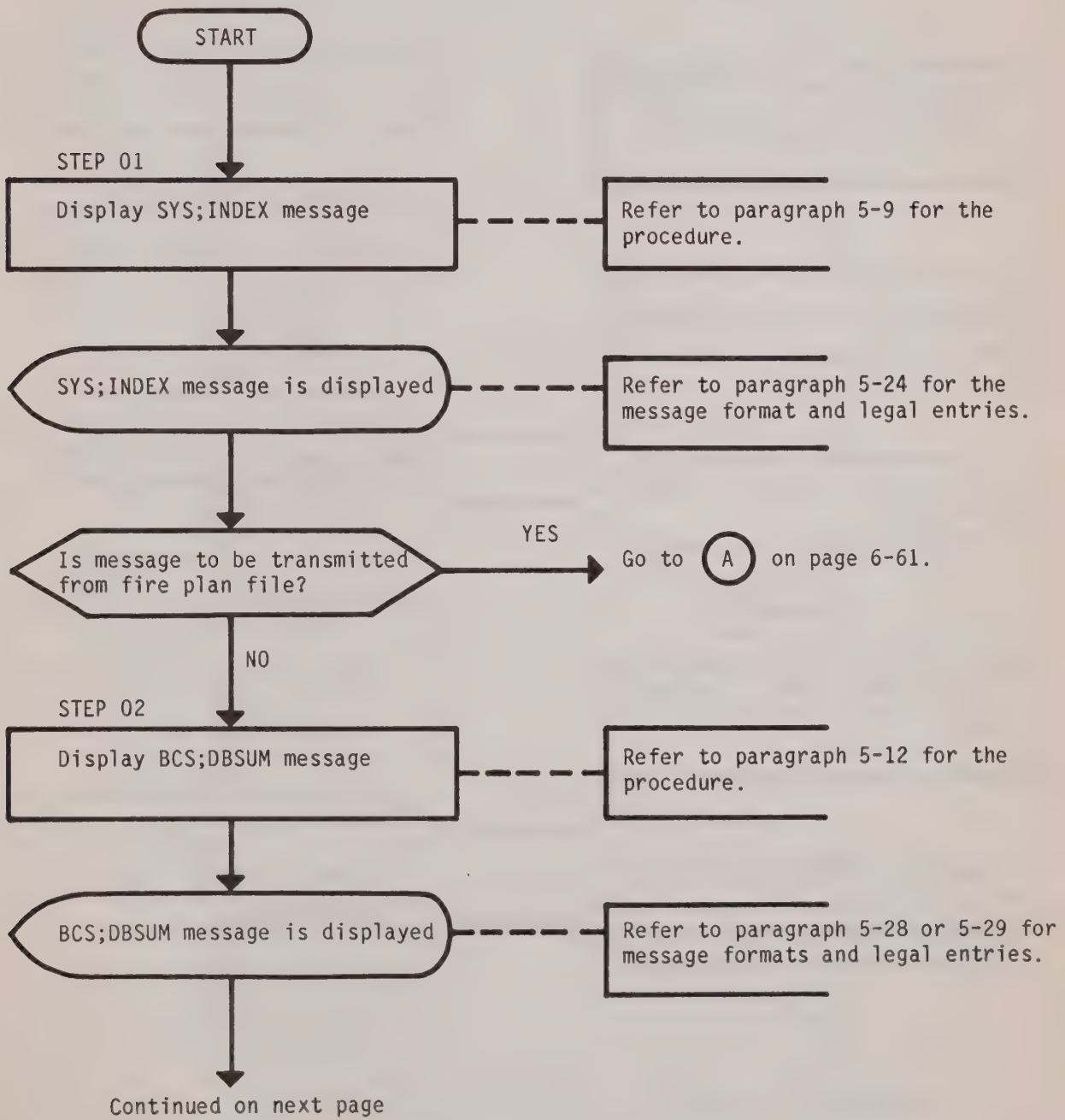
- Record a Data Base Using the SYS;SETUP Message.


START
STEP 01
Display SYS;SETUP message
Refer to paragraph 5-9 for the procedure.
SYS;SETUP message is displayed
Refer to paragraph 4-10 or 4-11 for message formats and legal entries.
STEP 02
Enter X, 1, or 2 into the DRI field. Press EXEC key.
The TTU contains space for two data base recordings. If a weapon model was chosen and you do not specify which data base is to be overwritten, the oldest base is overwritten. If a previously recorded data base was chosen and you do not specify which data base is to be overwritten and both data bases are recorded, the current data base is overwritten.
A square (■) appears under PLU in the middle display indicating a data base recording is in progress. The SYS;INDEX message is displayed.
You should not edit or add to the data base while recording is in progress. When the square under PLU disappears, the recording is done. Warning messages will also appear to tell you that recording is in progress and recording is done. When the SYS;INDEX message is redisplayed, the date/time of the latest data base recording is displayed.
STOP

6-27. TRANSMITTING INFORMATION IN THE DATA BASE

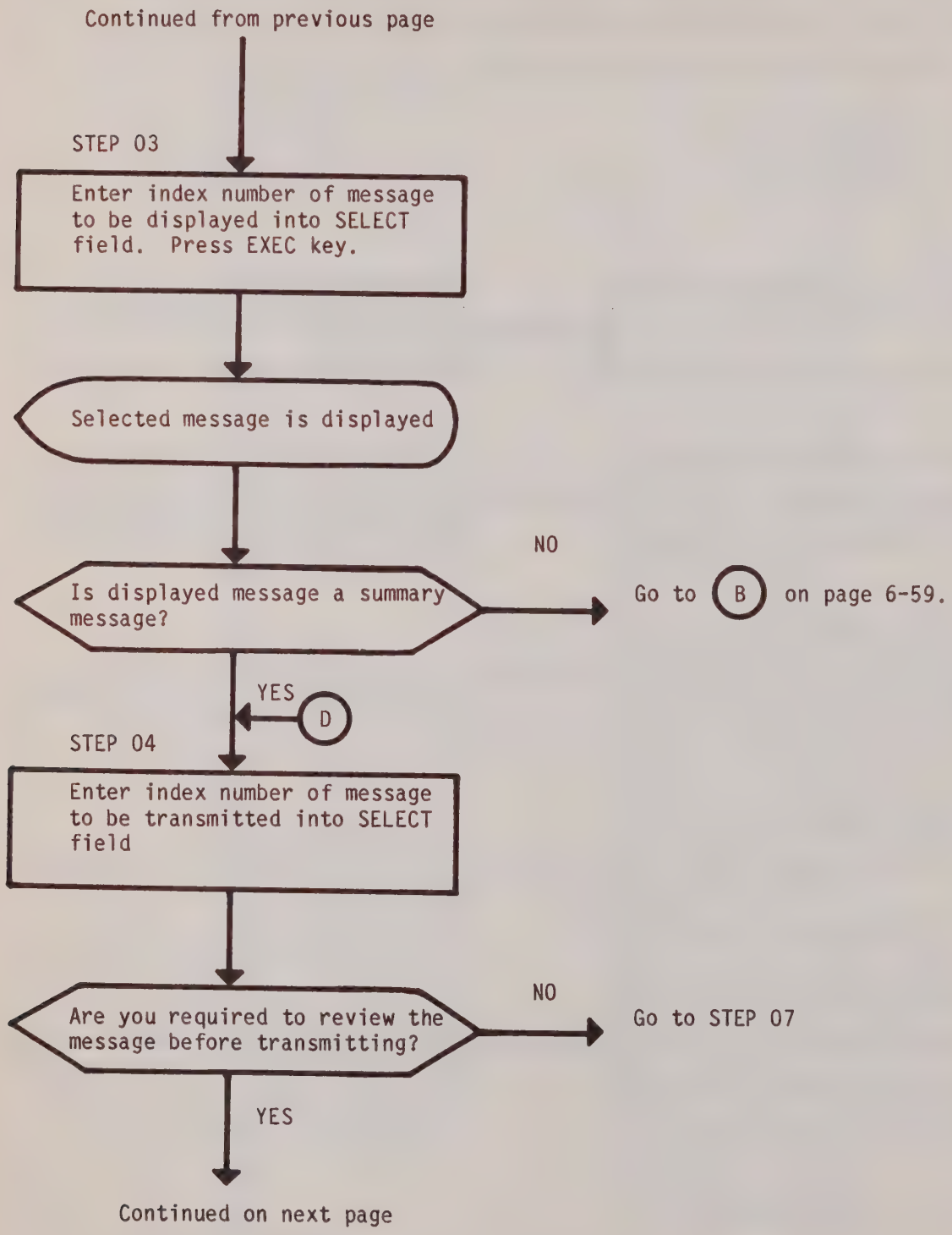
Use this flowchart to perform the following task:

- Transmit Information in the Data Base.

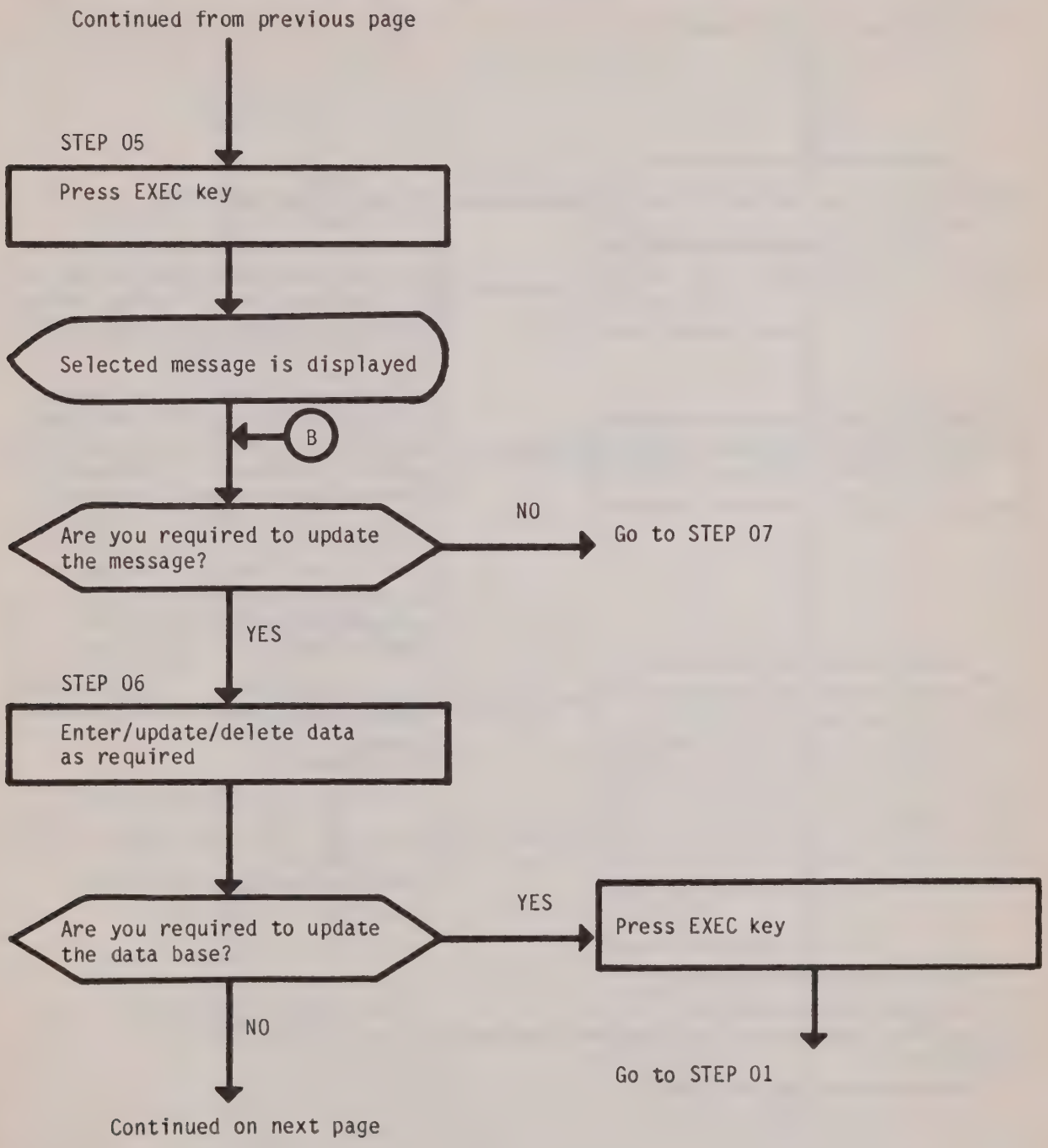

START
STEP 01
Display SYS;INDEX message
Refer to paragraph 5-9 for the procedure.
SYS;INDEX message is displayed
Refer to paragraph 5-24 for the message format and legal entries.
Is message to be transmitted from fire plan file?
YES
Go to (A) on page 6-61.
NO
STEP 02
Display BCS;DBSUM message
Refer to paragraph 5-12 for the procedure.
BCS;DBSUM message is displayed
Refer to paragraph 5-28 or 5-29 for message formats and legal entries.

Continued on next page

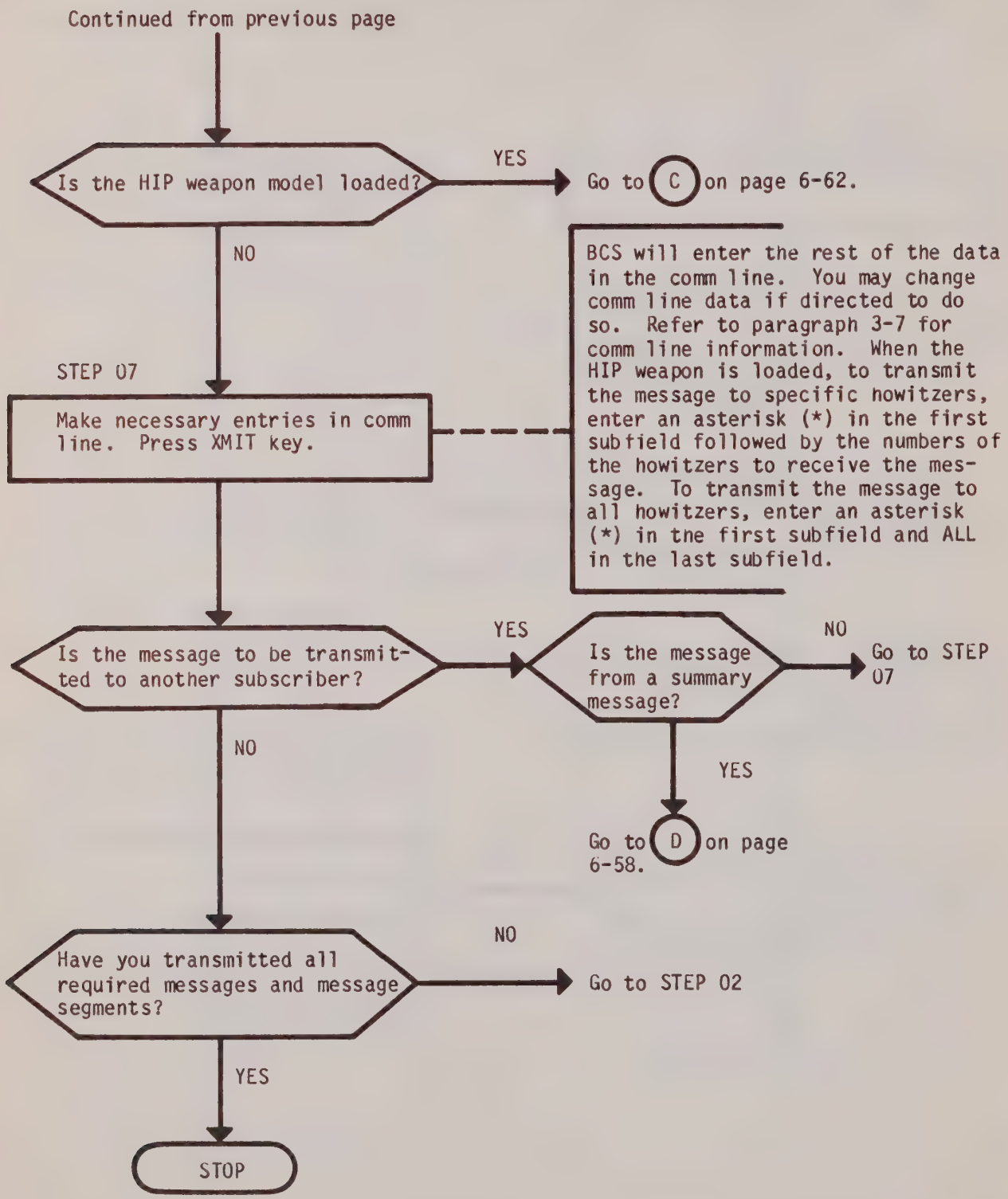
6-27. TRANSMITTING INFORMATION IN THE DATA BASE - CONTINUED


Continued from previous page
STEP 03
Enter index number of message to be displayed into SELECT field. Press EXEC key.
Selected message is displayed
Is displayed message a summary message?
NO
Go to B on page 6-59.
YES
D
STEP 04
Enter index number of message to be transmitted into SELECT field
Are you required to review the message before transmitting?
NO
Go to STEP 07
YES
Continued on next page

6-27. TRANSMITTING INFORMATION IN THE DATA BASE - CONTINUED

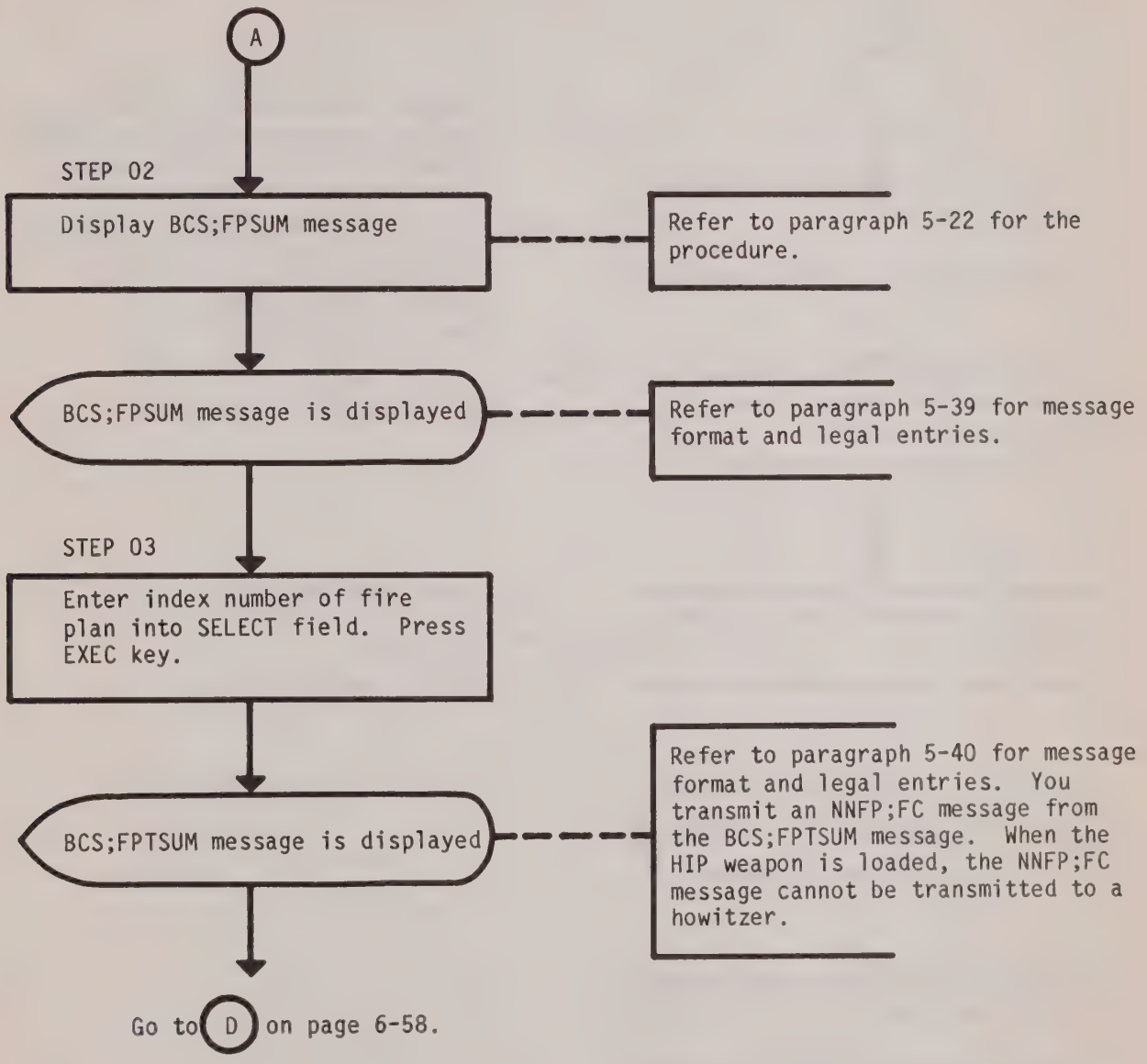


6-27. TRANSMITTING INFORMATION IN THE DATA BASE - CONTINUED


Continued from previous page
Is the HIP weapon model loaded?
YES
Go to C on page 6-62.
NO
STEP 07
Make necessary entries in comm line. Press XMIT key.
BCS will enter the rest of the data in the comm line. You may change comm line data if directed to do so. Refer to paragraph 3-7 for comm line information. When the HIP weapon is loaded, to transmit the message to specific howitzers, enter an asterisk (*) in the first subfield followed by the numbers of the howitzers to receive the message. To transmit the message to all howitzers, enter an asterisk (*) in the first subfield and ALL in the last subfield.
Is the message to be transmitted to another subscriber?
YES
Is the message from a summary message?
NO
Go to STEP 07
YES
Go to D on page 6-58.
NO
Have you transmitted all required messages and message segments?
NO
Go to STEP 02
YES
STOP

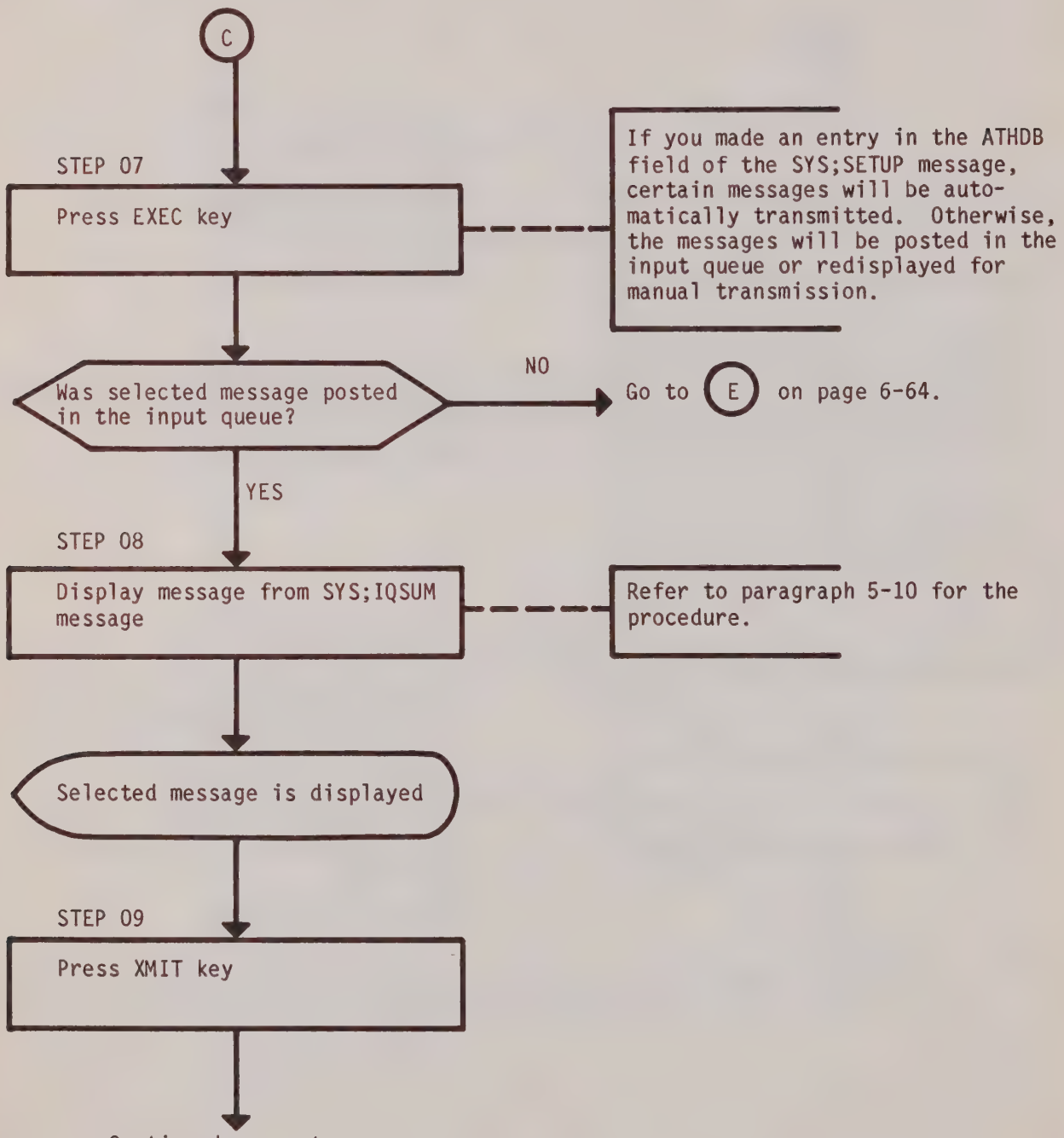
6-27. TRANSMITTING INFORMATION IN THE DATA BASE - CONTINUED

Continued from previous page


A
STEP 02
Display BCS;FPSUM message
Refer to paragraph 5-22 for the procedure.
BCS;FPSUM message is displayed
Refer to paragraph 5-39 for message format and legal entries.
STEP 03
Enter index number of fire plan into SELECT field. Press EXEC key.
BCS;FPTSUM message is displayed
Refer to paragraph 5-40 for message format and legal entries. You transmit an NNFP;FC message from the BCS;FPTSUM message. When the HIP weapon is loaded, the NNFP;FC message cannot be transmitted to a howitzer.
Go to D on page 6-58.

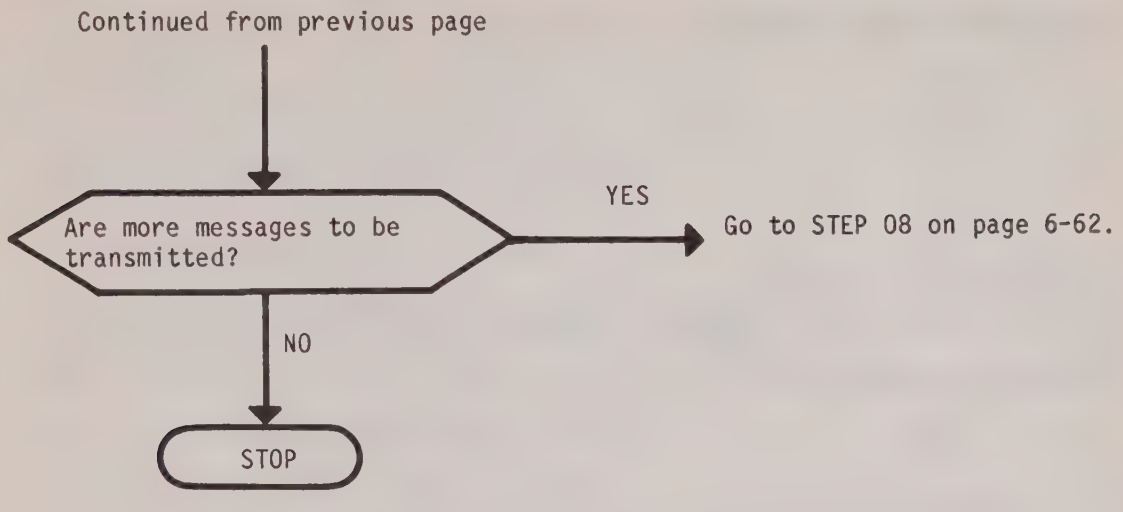
6-27. TRANSMITTING INFORMATION IN THE DATA BASE - CONTINUED

Continued from previous page


C
STEP 07
Press EXEC key
If you made an entry in the ATHDB field of the SYS;SETUP message, certain messages will be automatically transmitted. Otherwise, the messages will be posted in the input queue or redisplayed for manual transmission.
Was selected message posted in the input queue?
NO
Go to E on page 6-64.
YES
STEP 08
Display message from SYS;IQSUM message
Refer to paragraph 5-10 for the procedure.
Selected message is displayed
STEP 09
Press XMIT key

Continued on next page

6-27. TRANSMITTING INFORMATION IN THE DATA BASE - CONTINUED



6-27. TRANSMITTING INFORMATION IN THE DATA BASE - CONTINUED

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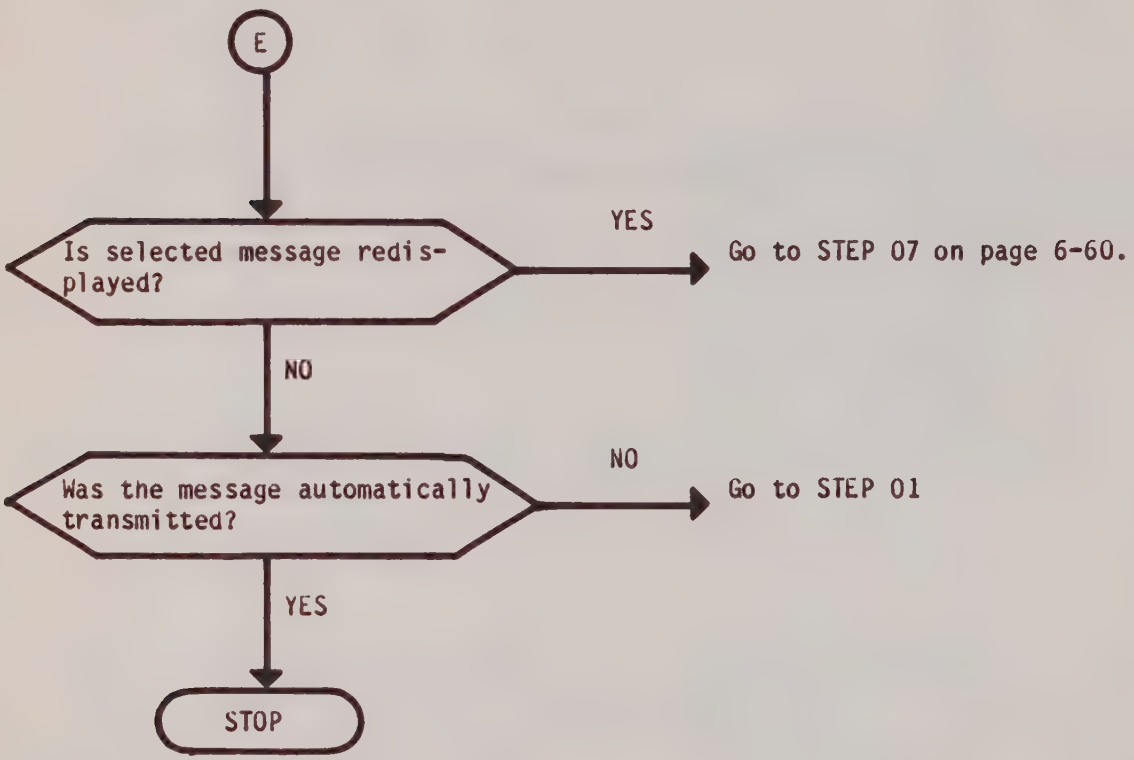

Section III. DATA BASE MESSAGE FORMATS

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6-28. HOWITZER STATUS UPDATE MESSAGE (HOW;UPDATE) (HIP)

a. Purpose. The HOW;UPDATE message is used to initialize or update howitzer location and status data in the data base for use in processing fire missions.

b. Source. The HOW;UPDATE message is displayed from the following sources:

- BCS;HOWSUM
- SYS;MSGSUM
- SYS;IQSUM.

c. Input. None.

d. Computer Processing. Pressing the EXEC key causes data to be entered into a Howitzer Update file and the Platoon Update file. Any time a HOW;UPDATE message with an entry of other than M or O in the STATUS field is executed, the CORD field of the AFU;UPDATE message will be updated with the averages of the entries in the CORD field in all HOW;UPDATE messages with an entry in the STATUS field other than M or O. When the CORD field of the AFU;UPDATE message is changed, the FULAT field is also updated. If there is no entry in the AZ field, it will be entered with the

6-28. HOWITZER STATUS UPDATE MESSAGE (HOW;UPDATE) (HIP) - CONTINUED

average of the AZ fields of the HOW;UPDATE messages in file with an entry in the STATUS field other than M or O.

Pressing the DELETE key causes the displayed HOW;UPDATE message to be deleted from the data base. A warning message will be displayed directing you to delete other data base messages from the deleted howitzer. A HOW;UPDATE message with an entry of L or R in the STATUS field cannot be deleted.

e. Output. The STATUS column of the middle display is updated.

f. Message Format and Legal Entries. The following HOW;UPDATE message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries and provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;UPDATE;FU:_/_/_/__/___;CORD:_____/_______/_____;GZ:___;
GUNORD:_;DTG:__/__/__;STATUS:_;RESTR:_____;
AZ:____;MAXEL:____;PTEMP:____
```

HOW;UPDATE; FU:_/_/_/__/___;CORD:_____/_______/_____;GZ:___;

HOW;UPDATE identifies the message as the howitzer status update message.

HOW;UPDATE; **FU:_/_/_/__/___;** CORD:_____/_______/_____;GZ:___;

FU indicates the howitzer's logical name. This is a required entry. Legal entries are:

FU: **_/** _/_/__/___;	Howitzer number	1 to 4
FU:_/ **_/** _/__/___;	Platoon	1 or 2
FU:_/_/ **_/** __/___;	Battery	A to Z
FU:_/_/_/ **__/** ___;	Battalion	1 to 99
FU:_/_/_/__/ **___;**	Regiment	1 to 999

6-28. HOWITZER STATUS UPDATE MESSAGE (HOW;UPDATE) (HIP) - CONTINUED

HOW;UPDATE;FU:_/_/_/__/___; **CORD:_____/_____/_____;** GZ:___;

CORD indicates the grid coordinates of the center of fire of the howitzer's unit's area of operations or the firing point coordinates. This is a required entry. Legal entries are:

CORD: **_____/** _____/_____;	Easting in meters	0 to 999999
CORD:_____/ **_____/** _____;	Northing in meters	0 to 11000000
CORD:_____/_____/ **_____;**	Altitude in meters	-9999 to +9999

HOW;UPDATE;FU:_/_/_/__/___;CORD:_____/_____/_____; **GZ:___;**

GZ specifies the grid zone in which coordinates are expressed. This field is used for zone-to-zone transformation computations. Legal entries are -60 to +60 (excluding zero).

Default = map mod grid zone

GUNORD:_; DTG:__/__/__;STATUS:_;RESTR:_____;

GUNORD indicates the gun order indicator. If there is an entry in this field, the firing orders will be computed by the platoon BCS and the howitzer will receive the FM;COMNDS message. If there is an entry in GUNORD, the entry in STATUS must be S. Legal entry is X.

6-28. HOWITZER STATUS UPDATE MESSAGE (HOW;UPDATE) (HIP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;UPDATE;FU:_/_/_/__/___;CORD:_____/_____/_____;GZ:___;
GUNORD:_;DTG:__/__/__;STATUS:_;RESTR:_____;
AZ:____;MAXEL:____;PTEMP:____
```

GUNORD:_; **DTG:__/__/__;** STATUS:_;RESTR:_____;

DTG indicates when the message was generated. This is a required entry. Legal entries are:

DTG: __/ __/__;	Day	1 to 31
DTG:__/ __/ __;	Hour	0 to 23
DTG:__/__/ __;	Minute	0 to 59

GUNORD:_;DTG:__/__/__; **STATUS:_;** RESTR:_____;

STATUS indicates the status of the howitzer. This field is updated from the HOW;OBSR message, the howitzer, and the BCS operator. This is a conditional entry. If there is an entry in RESTR, the entry must be L or R. If RESTR is blank, the entry must be Y, S, M, or O. Legal entries are:

Y - operational
O - out of action
M - moving
S - stationary
L - linked
R - relay linked
Blank - not given

Default = Y

6-28. HOWITZER STATUS UPDATE MESSAGE (HOW;UPDATE) (HIP) - CONTINUED

GUNORD:_;DTG:__/__/__;STATUS:_; **RESTR:_____;**

RESTR indicates the howtizer's restrictions. This is a conditional entry. If the entry in STATUS is L (linked) or R (relay), an entry is required in RESTR. If the entry in STATUS is Y, S, M, or O, the RESTR field must be blank. Legal entries are:

FM - fire mission (observer may only request fire mission data from the howitzer)
FMTGT - fire mission and target file (observer may request fire mission and target file data from the howitzer)
ALL - fire mission and target file

AZ:____; MAXEL:____;PTEMP:____ⅎ

AZ indicates the azimuth of fire in mils. The entry in this field is used to determine deflection. This is a required entry. Legal entries are 0 to 6399.

AZ:____; **MAXEL:____;** PTEMP:____ⅎ

MAXEL indicates the maximum elevation in mils. The entry in this field indicates the upper limit of quadrant elevation. Legal entries are 0 to 1600.

Default = 1275

AZ:____;MAXEL:____; **PTEMP:____ⅎ**

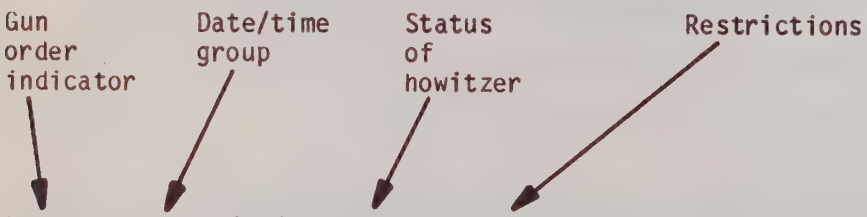
PTEMP indicates the powder temperature in degrees Fahrenheit. This field is used in ballistic computations. Legal entries are -130 to +145.

Default = 70

6-28. HOWITZER STATUS UPDATE MESSAGE (HOW;UPDATE) (HIP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;UPDATE;FU:_/_/_/__/___;CORD:_____/_____/_____;GZ:___;
GUNORD:_;DTG:__/__/__;STATUS:_;RESTR:_____;
AZ:____;MAXEL:____;PTEMP:____┘
```

g. Exploded View. Use the following exploded view as a way to review the message.



6-29. HOWITZER AMMUNITION STATUS UPDATE MESSAGE (HOW;AMOUP) (HIP)

a. Purpose. The HOW;AMOUP message is used to enter or update the status of ammunition available at the howitzer for use in processing fire missions, for reestablishing a howitzer's data base, and for updating the platoon ammunition file.

b. Source. The HOW;AMOUP message is displayed from the following sources:

- SYS;IQSUM
- BCS;HAMSUM
- SYS;MSGSUM.

If more than one segment is needed to enter all ammunition data, use the following procedure to access a blank segment. After you have executed a HOW;AMOUP message, redisplay the message and press the NEXT SEG key until a blank segment is displayed.

c. Input. You enter data concerning ammunition available at the howitzer. Each segment of the message can be used to process data for six projectiles, three powders, and six fuzes. The data base can store data for up to 26 projectiles, 9 powders, and 26 fuzes. To process all the ammunition data which the data base can store, you must use five segments of the message.

d. Computer Processing. Pressing the EXEC key causes the data in the HOW;AMOUP message to be stored in the fire unit file.

e. Output. The number of shells, powders, and fuzes displayed on the AFU;BAMOUP, BCS;DBSUM, and BCS;HAMSUM messages will be updated.

f. Message Format and Legal Entries. The following HOW;AMOUP message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;AMOUP;FU:_/_/_/__/___;AMOR:_;AMOE:_;AMOH:_;DTG:__/__/__;
PROJA:___/_/___._/____,___/_/___._/____,___/_/___._/____;
PROJB:___/_/___._/____,___/_/___._/____,___/_/___._/____;
PLOT:_____/_/____,_____/_/____,_____/_/____;
FZES:____/____,____/____,____/____,____/____,____/____,____/____┘
```

HOW;AMOUP;	FU:_/_/_/__/___;AMOR:_;AMOE:_;AMOH:_;DTG:__/__/__;

HOW;AMOUP identifies the message as the howitzer ammunition status message.

6-29. HOWITZER AMMUNITON STATUS UPDATE MESSAGE (HOW;AMOUP) (HIP) - CONTINUED

HOW;AMOUP; **FU:_/_/_/__/___;** AMOR:_;AMOE:_;AMOH:_;DTG:__/__/__;

FU indicates the howitzer's logical name. This is a required entry. Legal entries are:

FU: **_/** _/_/__/___;	Howitzer number	1 to 4
FU:_/ **_ /** _/__/___;	Platoon	1 to 2
FU:_/_/ **_/** __/___;	Battery	A to Z
FU:_/_/_/ **__/** ___;	Battalion	1 to 99
FU:_/_/_/__/ **___;**	Regiment	1 to 999

HOW;AMOUP;FU:_/_/_/__/___; **AMOR:_;** AMOE:_;AMOH:_;DTG:__/__/__;

AMOR indicates ammunition received. An entry in this field specifies that the ammunition has been received and adds the ammunition data entered in the HOW;AMOUP message to the ammunition data stored in the data base. This is a conditional entry. Make no entry in this field if there is an entry in the AMOE or AMOH fields. Legal entry is an X.

HOW;AMOUP;FU:_/_/_/__/___;AMOR:_; **AMOE:_;** AMOH:_;DTG:__/__/__;

AMOE indicates ammunition expended. An entry in this field specifies that the ammunition entered has been expended and subtracts the ammunition data entered in the HOW;AMOUP message from the ammunition data stored in the data base. This is a conditional entry. Make no entry in this field if there is an entry in the AMOR or AMOH fields. Legal entry is an X.

HOW;AMOUP;FU:_/_/_/__/___;AMOR:_;AMOE:_; **AMOH:_;** DTG:__/__/__;

AMOH indicates ammunition on hand. This field specifies that the ammunition specified is on hand for projectile, propellant, and fuze. This is a conditional entry. Make no entry in this field if there is an entry in the AMOR or AMOE fields. Legal entry is an X.

6-29. HOWITZER AMMUNITION STATUS UPDATE MESSAGE (HOW;AMOUP) (HIP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;AMOUP;FU:_/_/_/__/___;AMOR:_;AMOE:_;AMOH:_;DTG:__/__/__;
PROJA:___/_/___._/____,___/_/___._/____,___/_/___._/____;
PROJB:___/_/___._/____,___/_/___._/____,___/_/___._/____;
PLOT:_____/_/____,_____/_/____,_____/_/____;
FZES:____/____,____/____,____/____,____/____,____/____,____/____
```

HOW;AMOUP;FU:_/_/_/__/___;AMOR:_;AMOE:_;AMOH:_; **DTG:__/__/__;**

DTG indicates the time the message was transmitted. This is a required entry. Legal entries are:

DTG: __/ __/__;	Day	1 to 31
DTG:__/ __/ __;	Hour	0 to 23
DTG:__/__/ __;	Minute	0 to 59

NOTE

The PROJA line of the HOW;AMOUP message is described on the following page. The information given also applies to the PROJB line.

6-29. HOWITZER AMMUNITION STATUS UPDATE MESSAGE (HOW;AMOUP) (HIP) - CONTINUED

PROJA:___/_/___._/____,___/_/___._/____,___/_/___._/____;

PROJA indicates the projectile characteristics. The PROJA and PROJB lines each have three iterations of data subfields. Each segment of the message will hold data for up to six projectiles. The data base will hold data for up to 26 projectiles. This is an optional entry. If you make an entry in any iteration, you must make an entry in the first, second, and fourth subfields for that iteration. If you enter a square weight, there must be values before and after the decimal point. (For example, 0.5 or 7.0.) Legal entries are listed below. (For more information, refer to appendix G.)

PROJA:___/ _/___._/____,	Shell category	Three alphabetic characters
PROJA:___/ **_/** ___._/____,	Lot designator	One alphabetic character
PROJA:___/_/ **___._/** ___,	*Weight in pounds or squares (if entered in squares, it will be stored in pounds)	10.1 to 999.9 (if squares, 0.5 to 10.0)
PROJA:___/_/___._/ **___,**	Quantity	0 to 9999

*Default = shell weight specified in appendix M

6-29. HOWITZER AMMUNITION STATUS UPDATE MESSAGE (HOW;AMOUP) (HIP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;AMOUP;FU:_/_/_/__/___;AMOR:_;AMOE:_;AMOH:_;DTG:__/__/__;
PROJA:___/_/___._/____,___/_/___._/____,___/_/___._/____;
PROJB:___/_/___._/____,___/_/___._/____,___/_/___._/____;
PLOT:_____/_/____,_____/_/____,_____/_/____;
FZES:___/____,____/____,____/____,____/____,____/____,____/____E
```

```
PLOT:_____/_/____,_____/_/____,_____/_/____;
```

PLOT indicates propellant characteristics. Each segment of the message can hold data for up to three powders. The data base will hold data for up to nine propellants. This is an optional entry. If you make an entry in any iteration of PLOT, you must make an entry in all subfields for that iteration. Legal entries are listed below. (For more information, refer to appendix G.)

`PLOT:_____/` `_/____,`	Model number	One to six alphanumeric characters
`PLOT:_____/` `_/` `____,`	Lot	One alphabetic character
`PLOT:_____/_/` `____,`	Quantity	0 to 9999

```
FZES:___/___,____/____,____/____,____/____,____/____,____/____E
```

FZES indicates fuze characteristics. Each segment of the message can hold up to six sets of fuze data. The data base will hold up to 26 sets of fuze data. This is an optional entry. If you make an entry in any iteration, you must make an entry in both subfields for that iteration. Legal entries are listed below. (For more information, refer to appendix G.)

`FZES:` `____/` `____,`	Category	One to four alphanumeric characters
`FZES:____/` `____,`	Quantity	0 to 9999

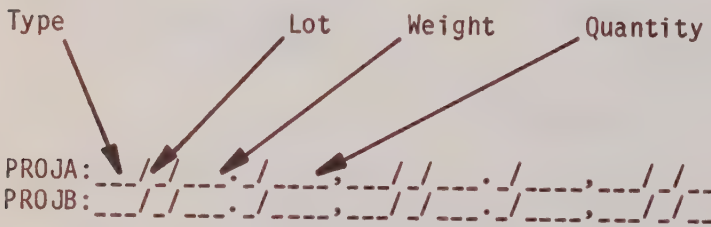
6-29. HOWITZER AMMUNITION STATUS UPDATE MESSAGE (HOW;AMOUP) (HIP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;AMOUP;FU:_/_/_/__/___;AMOR:_;AMOE:_;AMOH:_;DTG:__/__/__;
PROJA:___/_/___._/____,___/_/___._/____,___/_/___._/____;
PROJB:___/_/___._/____,___/_/___._/____,___/_/___._/____;
PLOT:_____/_/____,_____/_/____,_____/_/____;
FZES:____/____,____/____,____/____,____/____,____/____,____/____,____/____┘
```

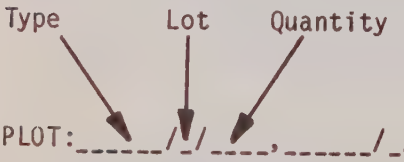
---

g. Exploded View. Use the following exploded view as a way to review the message.

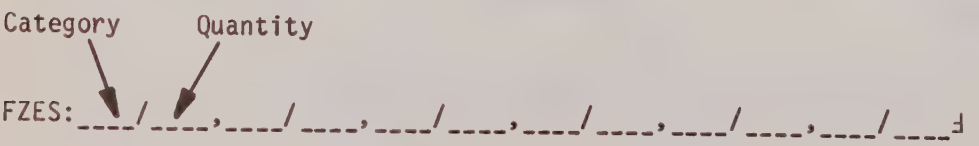
Projectile Characteristics



Propellant Characteristics



Fuze Characteristics



6-30. FIRE UNIT MASK INPUT MESSAGE (AFU;MASK)

a. Purpose. The AFU;MASK message is used for operator review, to enter or update mask data for the fire unit, and to transmit mask data.

b. Source. The AFU;MASK is displayed from the following summary messages:

- BCS;DBSUM
- SYS;MSGSUM
- SYS;IQSUM.

c. Input. You enter mask data into the AFU;MASK message. When the HIP weapon model is loaded, mask data is usually received from the howitzers. The data base will store data for up to 8 masks per howitzer or a total of 24 masks per fire unit.

d. Computer Processing. Pressing the EXEC key causes the data entered to be stored in the fire unit file.

e. Output. The number of masks displayed in the BCS;DBSUM message is updated.

f. Message Format and Legal Entries. The following AFU;MASK message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;MASK;FU:_/_/_/__/___;DELETE:_;
MASKA:_/____/____/____/_____;MASKB:_/____/____/___ /____;
MASKC:_/____/____/____/_____;MASKD:_/____/____/____/_____;
MASKE:_/____/____/____/_____;MASKF:_/____/____/____/_____;
MASKG:_/____/____/____/_____;MASKH:_/____/____/____/_____┘
GUN:__;MASK:1/__,2/__,3/__,4/__,5/__,6/__,7/__,8/__;
```

| AFU;MASK; | FU:_/_/_/__/___;DELETE:_;

AFU;MASK identifies the message as the fire unit mask input message.

6-30. FIRE UNIT MASK INPUT MESSAGE (AFU;MASK) - CONTINUED

AFU;MASK; | FU:_/_/_/__/___; | DELETE:_;

FU indicates the fire unit name for non-HIP weapons. You do not make any entry in this field for non-HIP weapon models. Upon execution of the AFU;MASK message, the fire unit name entered in the SYS;COMM message will be entered into this field. For the HIP weapon, FU indicates the howitzer logical name. It is a required entry for HIP. Values displayed for non-HIP weapons and legal entries for HIP are:

| FU:_/ | _/_/__/___;	Section	One alphabetic or numeric character, 1 to 4 (HIP only)
FU:_/ | _/ | _/__/___;	Platoon	One alphabetic or numeric character, 1 or 2 (HIP only)
FU:_/_/ | _/ | __/___;	Battery	One alphabetic or numeric character, A to Z (HIP only)
FU:_/_/_/ | __/ | ___ ;	Battalion	One or two alphabetic or numeric characters, 1 to 99 (HIP only)
FU:_/_/_/__/ | ___; |	Regiment	One to three alphabetic or numeric characters, 1 to 999 (HIP only)

AFU;MASK;FU:_/_/_/__/___; | DELETE:_; |

DELETE is a delete indicator. Legal entry is an X. This field is not used by BCS for processing. To delete a mask, erase the appropriate mask entries and execute the message.

NOTE

The MASKA field is described on the following page. The information given also applies to the MASKB through MASKH fields.

6-30. FIRE UNIT MASK INPUT MESSAGE (AFU;MASK) - CONTINUED

```
_____;P:_;SB:_/_/_/_/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;MASK;FU:_/_/_/__/___;DELETE:_;
MASKA:_/____/____/____/_____;MASKB:_/____/____/____/_____;
MASKC:_/____/____/____/_____;MASKD:_/____/____/____/_____;
MASKE:_/____/____/____/_____;MASKF:_/____/____/____/_____;
MASKG:_/____/____/____/_____;MASKH:_/____/____/____/_____;
GUN:__;MASK:1/__,2/__,3/__,4/__,5/__,6/__,7/__,8/__;
```

MASKA:_/____/____/____/_____; MASKB:_/____/____/____/_____;

MASKA refers to mask data. This is an optional entry. The data in this field is measured from the individual howitzers. Upon redisplay, the second and third subfields will be displayed as azimuths if they were initially entered as deflections. If you make an entry in any subfield, you must make an entry in all subfields. Legal entries are:

MASKA:_/ ____/____/____/_____;	Mask number	1 to 8
MASKA:_/ **____/** ____/____/_____;	Left azimuth/ deflection in mils	0 to 6399
MASKA:_/____/ **____/** ____/_____;	Right azimuth/ deflection in mils	0 to 6399
MASKA:_/____/____/ **____/** _____;	Range to center of mask in meters	0 to 9999
MASKA:_/____/____/____/ **_____;**	Elevation to mask in mils	-1600 to +1600

GUN:__; MASK:1/__,2/__,3/__,4/__,5/__,6/__,7/__,8/__;

GUN indicates the howitzer number that the mask(s) is associated with. This is a required entry for non-HIP weapons. For HIP, this is a computer generated entry based on the entry in the FU field. Legal entries are 1 to 12 for non-HIP weapons or 1 to 8 for the HIP weapon model.

6-30. FIRE UNIT MASK INPUT MESSAGE (AFU;MASK) - CONTINUED

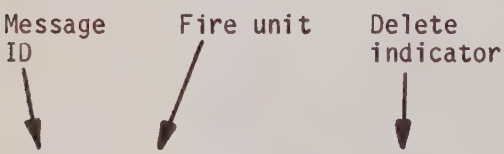
GUN:__; | MASK:1/__, | 2/__,3/__,4/__,5/__,6/__,7/__,8/__;

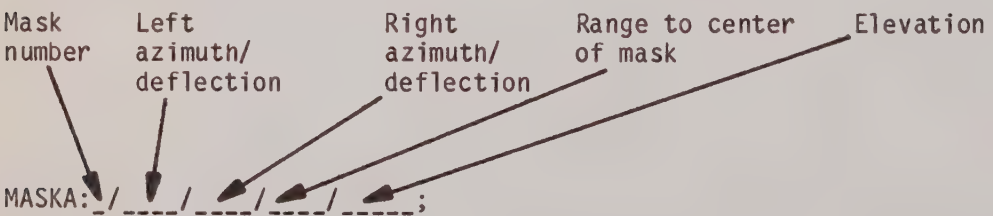
MASK indicates whether the left and right mask limits for each mask number are in azimuth or deflection. This is an optional entry. If the type of sight (ST field in AFU;UPDATE message) has an entry of 1, masks must be entered using azimuth. Legal entries are:

MASK:1/ __,	Mask number	This is a protected subfield
MASK:1/ __,	Azimuth or deflection	AZ or DF

Default = AZ

g. Exploded View. Use the following exploded view as a way to review the message.





6-30. FIRE UNIT MASK INPUT MESSAGE (AFU;MASK) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;MASK;FU:_/_/_/__/___;DELETE:_;
MASKA:_/____/____/____/_____;MASKB:_/____/____/____/_____;
MASKC:_/____/____/____/_____;MASKD:_/____/____/____/_____;
MASKE:_/____/____/____/_____;MASKF:_/____/____/____/_____;
MASKG:_/____/____/____/_____;MASKH:_/____/____/____/_____;
GUN:__;MASK:1/__,2/__,3/__,4/__,5/__,6/__,7/__,8/__;
```

Howitzer number

Mask limits indicator

```
GUN:__;MASK:1/__,2/__,3/__,4/__,5/__,6/__,7/__,8/__;
```

6-31. MUZZLE VELOCITY VARIATION MESSAGE (BCS;MVV) (NON-HIP)

a. Purpose. The BCS;MVV message is used to store, enter, or delete Muzzle Velocity Variation (MVV) data for each of 12 howitzers.

b. Source. The BCS;MVV message is displayed from the BCS;MVVSUM message.

c. Input. You enter historical muzzle velocity variation data or muzzle velocity data directly into the BCS;MVV messsage. Measured muzzle velocity variation data displayed in the BCS;MVV message is entered into the data base through the BCS;MVD message. (Refer to paragraph 6-16.) MVV data for each shell family and each powder model group can be stored.

d. Computer Processing. Pressing the EXEC key causes the BCS;MVV message to be updated.

e. Output. The SYS;INDEX message is displayed.

f. Message Format and Legal Entries. The following BCS;MVV message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

```
BCS;MVV;GUN:__;
MVV1:____/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
MVV2:____/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
MVV3:____/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
MVV4:____/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
MVV5:____/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
MVV6:____/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
MVV7:____/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
MVV8:____/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
MVV9:____/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
```

BCS;MVV; GUN:__;

BCS;MVV identifies the message as the BCS muzzle velocity variation message.

BCS;MVV; **GUN:__;**

GUN tells you the howitzer number for the message being displayed. This is a protected entry which you cannot change. Values displayed are 1 through 12.

6-31. MUZZLE VELOCITY VARIATION MESSAGE (BCS;MVV) (NON-HIP) - CONTINUED

NOTE

The MVV1 line of the BCS;MVV message is described below. The information given is also applicable to lines MVV2 through MVV9.

MVV1: ____/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;

MVV1 indicates the line number. Each line can contain three groups of muzzle velocity variation data.

MVV1: |____/| _____/_/___._/_, |____/| _____/_/___._/_, |____/| _____/_/___._/_;

These subfields indicate the shell type for each of the groups of MVV data. Legal entries are listed in appendix G.

MVV1:____/ |_____/| _/___._/_,____/ |_____/| _/___._/_,____/ |_____/| _/___._/_;

These subfields indicate the powder model for each of the groups of MVV data. Legal entries are listed in appendix G.

MVV1:____/_____/ |_/| ___._/_,____/_____/ |_/| ___._/_,____/_____/ |_/| ___._/_;

These subfields indicate the charge number for each of the groups of MVV data. Legal entries are 1 through 9.

MVV1:____/_____/_/ |___._/| _,____/_____/_/ |___._/| _,____/_____/_/ |___._/| _;

These subfields indicate in meters per second the muzzle velocity variation stored for each of the groups of MVV data. It is also used to enter muzzle velocity data which converts to MVV data when executed. Legal entries are -99.9 to +999.9. If no MVV data has been input into the data base, an MVV of zero will be displayed. (Refer to appendix M for muzzle velocity data.)

6-31. MUZZLE VELOCITY VARIATION MESSAGE (BCS;MVV) (NON-HIP) - CONTINUED

```
BCS;MVV;GUN:__;
MVV1:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___._/_;
MVV2:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___._/_;
MVV3:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___._/_;
MVV4:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___._/_;
MVV5:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___._/_;
MVV6:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___._/_;
MVV7:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___._/_;
MVV8:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___._/_;
MVV9:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___._/_;
```

```
MVV1:____/______/_/___./ |_,| ____/______/_/___./ |_,| ____/______/_/___./ |_;|
```

These subfields indicate the MVV type or to initiate deletion of that MVV data for each of the groups of MVV data. If you make an entry in this subfield on any iteration, all entries for that iteration are required. Legal entries are:

M - Measured
H - Historical
D - Delete

---

g. Exploded View. Not applicable.

6-32. MUZZLE VELOCITY VARIATION MESSAGE (BCS;MVV) (HIP)

a. Purpose. The BCS;MVV message is used to store, enter, transmit, or delete Muzzle Velocity Variation (MVV) data for each of 8 howitzers. It is received from the howitzers.

b. Source. The BCS;MVV message is displayed from the BCS;MVVSUM message.

c. Input. You enter historical or measured muzzle velocity variation data directly into the BCS;MVV messsage. MVV data for each shell family and each powder model group can be stored.

d. Computer Processing. Pressing the EXEC key causes the BCS;MVV message to be updated. Pressing the XMIT key transmits the BCS;MVV message to the howitzers.

e. Output. Not applicable.

f. Message Format and Legal Entries. The following BCS;MVV message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
BCS;MVV;GUN:__;
MVV1:___/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
MVV2:___/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
MVV3:___/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
MVV4:___/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
MVV5:___/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
MVV6:___/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
MVV7:___/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
MVV8:___/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
MVV9:___/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;
```

BCS;MVV; GUN:__;

BCS;MVV identifies the message as the BCS muzzle velocity variation message.

BCS;MVV; **GUN:__;**

GUN tells you the howitzer number for the message being displayed. This is a protected entry which you cannot change. It is computer generated from the entry in the SB field of the comm line. Values displayed are 1 through 8.

6-32. MUZZLE VELOCITY VARIATION MESSAGE (BCS;MVV) (HIP) - CONTINUED

NOTE

The MVV1 line of the BCS;MVV message is described below. The information given is also applicable to lines MVV2 through MVV9.

MVV1: ____/_____/_/___._/_,____/_____/_/___._/_,____/_____/_/___._/_;

MVV1 indicates the line number. Each line can contain three groups of muzzle velocity variation data.

MVV1: |____/| _____/_/___._/_, |____/| _____/_/___._/_, |____/| _____/_/___._/_;

These subfields indicate the shell type for each of the groups of MVV data. Legal entries are listed in appendix G.

MVV1:____/ |_____/| _/___._/_,____/ |_____/| _/___._/_,____/ |_____/| _/___._/_;

These subfields indicate the powder model for each of the groups of MVV data. Legal entries are listed in appendix G.

MVV1:____/_____/ |_/| ___._/_,____/_____/ |_/| ___._/_,____/_____/ |_/| ___._/_;

These subfields indicate the charge number for each of the groups of MVV data. Legal entries are 1 through 9.

MVV1:____/_____/_/ |___._/| _,____/_____/_/ |___._/| _,____/_____/_/ |___._/| _;

These subfields indicate in meters per second the muzzle velocity variation stored for each of the groups of MVV data. It is also used to enter muzzle velocity data which converts to MVV data when executed. Legal entries are -99.9 to +999.9. If no MVV data has been input into the data base, an MVV of zero will be displayed. (Refer to appendix M for muzzle velocity data.)

6-32. MUZZLE VELOCITY VARIATION MESSAGE (BCS;MVV) (HIP) - CONTINUED

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
BCS;MVV;GUN:__;
MVV1:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___._/_;
MVV2:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___._/_;
MVV3:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___._/_;
MVV4:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___._/_;
MVV5:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___ _ _
MVV6:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___._/_;
MVV7:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___._/_;
MVV8:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___._/_;
MVV9:____/______/_/___._/_,____/______/_/___._/_,____/______/_/___._/_;
```

```
MVV1:____/______/_/___./ |_,| ____/______/_/___./ |_,| ____/______/_/___./ |_;|
```

These subfields indicate the MVV type or to initiate deletion of that MVV data for each of the groups of MVV data. If you make an entry in this subfield on any iteration, all entries for that iteration are required. Legal entries are:

M - Measured
H - Historical
D - Delete

---

g. Exploded View. Not applicable.

6-33. MUZZLE VELOCITY DERIVATION MESSAGE (BCS;MVD)

a. Purpose. The BCS;MVD message is used to compute muzzle velocity variation data and store it in the data base.

b. Source. The BCS;MVD message is displayed from the SYS;MSGSUM message.

c. Input. You enter muzzle velocity data into the BCS;MVD message. The source of this data is the M90 velocimeter report.

d. Computer Processing. Pressing the EXEC key causes the BCS to calculate the MVV data for the howitzer and shell type being fired and to store the data in the fire unit file.

e. Output. The BCS;MVV message for the appropriate howitzer is updated.

f. Message Format and Legal Entries. The following BCS;MVD message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are given.

BCS;MVD;GUN:__;CHG:_;LOT:_/_;PTEMP:____;
M90;MV:___._;

BCS;MVD; GUN:__;CHG:_;LOT:_/_;PTEMP:____;

BCS;MVD identifies the message as the BCS muzzle velocity derivation message.

BCS;MVD; **GUN:__;** CHG:_;LOT:_/_;PTEMP:____;

GUN indicates the gun or howitzer fired. This is a required entry. Legal entries are 1 to 12 for non-HIP weapon models or 1 to 8 for the HIP weapon model.

BCS;MVD;GUN:__; **CHG:_;** LOT:_/_;PTEMP:____;

CHG indicates the charge fired. This is a required entry. Legal entries are listed in appendix G.

6-33. MUZZLE VELOCITY DERIVATION MESSAGE (BCS;MVD) - CONTINUED

BCS;MVD;GUN:__;CHG:_; **LOT:_/_;** PTEMP:____;

LOT indicates the shell and powder lots fired. This is a required entry. Legal entries are:

LOT:_/ _;	Shell lot	One alphabetic character
LOT:_/ **_;**	Powder lot*	One alphabetic character

*This is required for 155mm and 203mm weapons only.

BCS;MVD;GUN:__;CHG:_;LOT:_/_; **PTEMP:____;**

PTEMP indicates the powder temperature in degrees Fahrenheit. This is a required entry. Legal entries are -130 to +145.

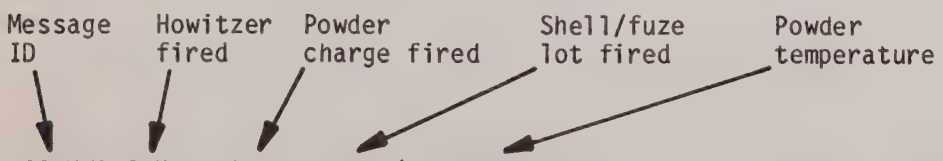
M90; MV:___._;

M90 indicates an M90 device. This is a protected entry.

M90; **MV:___._;**

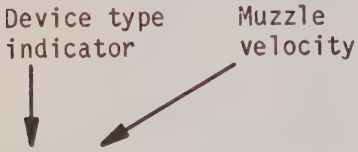
MV indicates the muzzle velocity in meters per second. This is a required entry. Legal entries are 0 to 999.9.

g. Exploded View. Use the following exploded view as a way to review the message.



6-33. MUZZLE VELOCITY DERIVATION MESSAGE (BCS;MVD) - CONTINUED

BCS;MVD;GUN:__;CHG:_;LOT:_/_;PTEMP:____;
M90;MV:___._;



6-34. OBSERVER LOCATION INPUT MESSAGE (FM;OBCO)

a. Purpose. The FM;OBCO message is for operator review and to enter, update, or transmit observer data.

b. Source. The FM;OBCO message is displayed from the following summary messages:

- SYS;IQSUM
- SYS;MSGSUM
- BCS;OBSUM.

c. Input. You enter observer data such as observer number and location. The data base can store data for up to 30 observers. Each set of observer data must be entered into the file through a separate FM;OBCO message.

d. Processing. Pressing the EXEC key causes the observer data to be stored in the observer file.

e. Output. The number of observers displayed under OB in the middle display of the BCU is updated. The number of observers displayed in the BCS;DBSUM message is updated.

f. Message Format and Legal Entries. The following FM;OBCO message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
FM;OBCO;CAKKEY:__;OB:__;CLDHT:___;GLLDCO:___;VISIB:__;
CORD:______/________/_____;GZ:___;SPHERE:_;DTG:__/__/__
ECRD:______/________;EDT:__/__/__;EOB:__;
```

FM;OBCO; CAKKEY:__;OB:__;CLDHT:___;GLLDCO:___;VISIB:__;

FM;OBCO identifies the message as the observer location input message.

FM;OBCO; **CAKKEY:__;** OB:__;CLDHT:___;GLLDCO:___;VISIB:__;

CAKKEY indicates the encryption code. This is an optional entry. This field is used only when the operator has encoded the message text. Legal entries are 0 through 9, A through Z, and the special characters +, -, &, #, ?, ., and *.

6-34. OBSERVER LOCATION INPUT MESSAGE (FM;OBCO) - CONTINUED

FM;OBCO;CAKKEY:__; **OB:__;** CLDHT:___;GLLDCO:___;VISIB:__;

OB indicates the observer's identifying number. You may be required to encode the data in this field when transmitting to Firefinder. This is a required entry. Legal entries are 0 to 99. If you are encoding the data, the BCS will accept any number or letter.

FM;OBCO;CAKKEY:__;OB:__; **CLDHT:___;** GLLDCO:___;VISIB:__;

CLDHT indicates cloud height above the observer in tens of meters. This data is used for Copperhead missions. This is an optional entry. Legal entries are 0 to 999. If this field is blank the first time the message is executed, it will default to 999. However, if an entry was made, when the observer data is updated later and no entry is made in the CLDHT field, it will not be updated with the default value. If the entry you previously entered is deleted using the ERASE key, the entry will remain in the data base. In both cases, the entry first stored in the data base will remain. All other legal entries will update the data base.

FM;OBCO;CAKKEY:__;OB:__;CLDHT:___; **GLLDCO:___;** VISIB:__;

GLLDCO indicates the observer's laser code. This data is used for Copperhead missions. This is an optional entry. If the entry you previously entered is deleted using the ERASE key, the entry will remain in the data base. Legal entries are 111 to 888.

FM;OBCO;CAKKEY:__;OB:__;CLDHT:__;GLLDCO:___; **VISIB:__;**

VISIB indicates the visibility code. This data is used for Copperhead missions. This is an optional entry. Legal entries are:

3 - 30 percent visibility (2000 to 4000 meters)
5 - 50 percent visibility (4000 to 7500 meters)
10 - 100 percent visibility (7500 meters or greater)
Blank - not given

If this field is blank the first time the message is executed, it will default to 10. However, if an entry was made, when the observer data is updated later and no entry is made in the VISIB field, it will not be updated with the default value. If the entry you previously entered is deleted using the ERASE key, the entry will remain in the data base. In both cases, the entry first stored in the data base will remain. All other legal entries will update the data base.

6-34. OBSERVER LOCATION INPUT MESSAGE (FM;OBCO) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
FM;OBCO;CAKKEY:__;OB:__;CLDHT:___;GLLDCO:___;VISIB:__;
CORD:_____/_______/_____;GZ:___;SPHERE:_;DTG:__/__/__Ⅎ
ECRD:_____/_______;EDT:__/__/__;EOB:__;
```

CORD:_____/_______/_____; GZ:___;SPHERE:_;DTG:__/__/__Ⅎ

CORD indicates the observer's coordinates. This is an optional entry. An entry in this field will replace any coordinates currently stored for the observer specified. This data is also used to inform Firefinder where to emplace. Legal entries are:

CORD:_____/ _______/_____;	Easting in meters	0 to 999999
CORD:_____/ **_______/** _____;	Northing in meters	0 to 11000000
CORD:_____/_______/ **_____;**	Altitude in meters	-9999 to +9999

CORD:_____/_______/_____; **GZ:___;** SPHERE:_;DTG:__/__/__Ⅎ

GZ indicates the grid zone of the observer coordinates. This is an optional entry. Legal entries are -60 to +60 (excluding zero).

Default = map mod grid zone as entered in the SPRT;MAP message

---

CORD:_____/_______/_____;GZ:___; **SPHERE:_;** DTG:__/__/__Ⅎ

SPHERE indicates the spheroid code of the observer coordinates. This is an optional entry. Legal entries are 1 to 8.

Default = map mod spheroid code as entered in the SPRT;MAP message

---

6-34. OBSERVER LOCATION INPUT MESSAGE (FM;OBCO) - CONTINUED

CORD:_____/_____/____;GZ:___;SPHERE:_; **DTG:__/__/__┘**

DTG indicates the date/time group. The BCS enters data into this field to indicate the system time when the observer was added to the observer file or the observer file was updated. The field is not protected from operator entry. It is also used to tell Firefinder when to be emplaced. You may be required to encode this data for transmission to Firefinder. If you are encoding the data, the BCS will accept any number of letter. Legal entries are:

DTG:__/ __/__┘	Day	1 to 31
DTG:__/ **__/** __┘	Hour	0 to 23
DTG:__/__/ **__┘**	Minute	0 to 59

Default = system date/time

ECRD:_____/_____; EDT:__/__/__;EOB:__;

ECRD indicates the encryption coordinates in meters. It is used when there is an entry in the CAKKEY field. If you are using a five-digit short coordinate, right-justify the entries prior to transmission. If you are using a four-digit short coordinate, add a zero to the end of the coordinate (ones position) and then right justify the entry prior to transmission. The altitude in the CORD field will be transmitted to Firefinder in the clear since there is no subfield in ECRD for altitude. It is not used by BCS in processing. Legal entries are A through Z, 0 through 9, and the special characters +, -, &, #, ?, ., and *.

ECRD:_____/ _____;	Easting	
ECRD:_____/ **_____;**	Northing	

6-34. OBSERVER LOCATION INPUT MESSAGE (FM;OBCO) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
FM;OBCO;CAKKEY:__;OB:__;CLDHT:___;GLLDCO:___;VISIB:__;
CORD:_____/_______/_____;GZ:___;SPHERE:_;DTG:__/__/__┘
ECRD:_____/_______;EDT:__/__/__;EOB:__;
```

ECRD:_____/_______; **EDT:__/__/__;** EOB:__;

EDT indicates the date and time of encryption. It is used when there is an entry in the CAKKEY field. It is not used by BCS in processing. Legal entries are A through Z, 0 through 9, and the special characters +, -, &, #, ?, ., and *.

EDT:__/ __/__; Day

EDT:__/ **__/** __; Hour

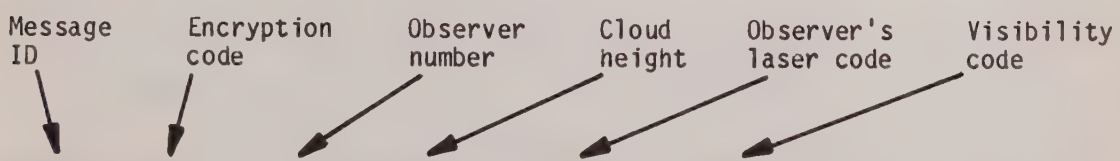
EDT:__/__/ **__;** Minute

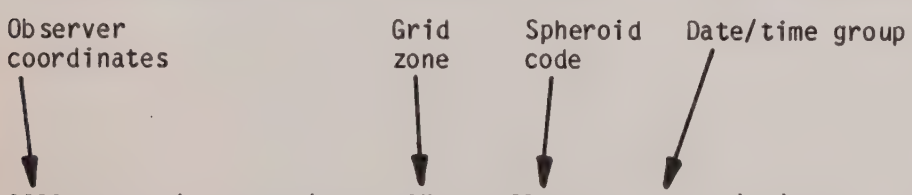
ECRD:_____/_______;EDT:__/__/__; **EOB:__;**

EOB indicates the encryption observer number. It is used when there is an entry in the CAKKEY field. It is not used by BCS in processing. Legal entries are A through Z, 0 through 9, and the special characters +, -, &, #, ?, ., and *.

---

g. Exploded View. Use the following exploded view as a way to review the message.





6-34. OBSERVER LOCATION INPUT MESSAGE (FM;OBCO) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
FM;OBCO;CAKKEY:__;OB:__;CLDHT:___;GLLDCO:___;VISIB:__;
CORD:______/________/_____;GZ:___;SPHERE:_;DTG:__/__/__
ECRD:______/________;EDT:__/__/__;EOB:__;
```

Encryption coordinates

Encryption date/time

Encryption observer

```
ECRD:______/________;EDT:__/__/__;EOB:__;
```

6-35. SUPPORT BATTLEFIELD GEOMETRY MESSAGE (SPRT;BGEOM)

a. Purpose. The SPRT;BGEOM message is for operator review and is used to establish or update up to 10 Restricted Fire Areas (RFA's) and one Forward Line Of Own Troops (FLOT).

b. Source. The SPRT;BGEOM message is displayed from the following summary messages:

- BCS;GEOSUM
- SYS;IQSUM
- SYS;MSGSUM.

c. Input. You enter data concerning circular RFA's, such as location and radius. You can also enter data concerning FLOT's, such as 2 to 30 points in sequence that do not cross and are contained in the map mod spheroid, grid zone, and adjacent grid zones.

d. Computer Processing. Pressing the EXEC key causes the data entered in the SPRT;BGEOM message to be entered into the support geometry file. The support geometry file can hold up to 10 RFA's and one FLOT, each of which must be entered into the data base through a separate SPRT;BGEOM message.

e. Output. The number of FSCM's displayed under FC in the middle display is updated. The number of FSCM's listed in the BCS;DBSUM message is updated. The BCS;GEOSUM message is updated.

f. Message Format and Legal Entries. The following SPRT;BGEOM message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SPRT;BGEOM:____/_____;DELETE:_;EDTG:__/__/__,__/__/__;
WIDTH:____;FCORD:_____;APL:_/_/_;
CRD1:__/_____/_____/_____,__/_____/_____/_____;
CRD2:__/_____/_____/_____,__/_____/_____/_____;
CRD3:__/_____/_____/_____,__/_____/_____/_____;
GZ:___;SPHERE:_;AP:_
```

6-35. SUPPORT BATTLEFIELD GEOMETRY MESSAGE (SPRT;BGEOM) - CONTINUED

SPRT;BGEOM:____/_____; DELETE:_;EDTG:__/__/__,__/__/__;

SPRT;BGEOM indentifies the message as the support battlefield geometry message. It specifies the type and name of the FSCM. It is a required entry. Legal entries are:

SPRT;BGEOM:____/ _____;	Type	RFA or FLOT
SPRT;BGEOM:____/ **_____;**	Name	One to six alphabetic or numeric characters

SPRT;BGEOM:____/_____; **DELETE:_;** EDTG:__/__/__,__/__/__;

DELETE is a delete indicator. This field is not used by BCS for processing. To delete an RFA or FLOT, use the BCS;GEOSUM message.

SPRT;BGEOM:____/_____;DELETE:_; **EDTG:__/__/__,__/__/__;**

EDTG indicates the effective date and time for the FSCM. This data is stored but not used by BCS for processing. Legal entries are:

EDTG: __/ __ / , __ / __ ;	Start day	1 to 31
EDTG:__/ **__/** __,__/__/__;	Start hour	0 to 23
EDTG:__/__/ **__,** __/__/__;	Start minute	0 to 59
EDTG:__/__/__, **__/** __/__;	End day	1 to 31
EDTG:__/__/__,__/ **__/** __;	End hour	0 to 23
EDTG:__/__/__,__/__/ **__;**	End minute	0 to 59

6-35. SUPPORT BATTLEFIELD GEOMETRY MESSAGE (SPRT;BGEOM) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SPRT;BGEOM:____/_____;DELETE:_;EDTG:__/__/__,__/__/__;
WIDTH:____;FCORD:_________;APL:_/_/_;
CRD1:__/_____/_______/_____,__/_____/_______/_____;
CRD2:__/_____/_______/_____,__/_____/_______/_____;
CRD3:__/_____/_______/_____,__/_____/_______/_____;
GZ:___;SPHERE:_;AP:_ⱻ
```

WIDTH:____; FCORD:_____;APL:_/_/_;

WIDTH indicates the radius of the RFA. This is a required entry when you are entering a circular RFA and there is no entry in DELETE. Otherwise, leave this field blank. Legal entries are 1 to 9999.

WIDTH:____; **FCORD:_____;** APL:_/_/_;

FCORD indicates the coordinating agency. This is the agency that is establishing the FSCM. This is a required entry when you are entering a FLOT. Legal entries are A through Z, 0 through 9, and the special characters except for /, @, ⱻ, :, ;, ., and ,.

WIDTH:____;FCORD:_____; **APL:_/_/_;**

APL indicates ammunition restrictions. This field is not used by BCS.

NOTE

The CRD1 field of the SPRT;BGEOM message is described on the following page. The information given is also applicable to the CRD2 and CRD3 fields.

6-35. SUPPORT BATTLEFIELD GEOMETRY MESSAGE (SPRT;BGEOM) - CONTINUED

CRD1:__/_____/_______/____,__/_____/_______/____;

CRD1 indicates the coordinates of a point. This is a conditional entry. When you are establishing an RFA, you must make an entry in the second and third subfields of the first iteration of CRD1. The second iteration of CRD1, CRD2, and CRD3 will be blank. When you are entering a FLOT, the first, second, and third subfields of the first and second iteration must be entered. (If you make an entry in the second iteration of CRD1, CRD2, or CRD3, then you must make an entry in the first iteration of that line.) Legal entries are:

CRD1:__/ _____/_______/_____,	Point coordinate number	01 to 30
CRD1:__/ **_____/** _______/_____,	Easting	0 to 999999
CRD1:__/_____/ **_______/** _____,	Northing	0 to 11000000
CRD1:__/_____/_______/ **_____,**	Altitude*	-9999 to +9999

*Altitude is only stored in the data base.

GZ:___; SPHERE:_;AP:_┘

GZ indicates the grid zone of the FSCM. This is an optional entry. Legal entries are -60 to +60 (excluding zero).

GZ:___; **SPHERE:_;** AP:_┘

SPHERE indicates the spheroid code used. This is an optional entry. Legal entries are 1 to 8.

GZ:___;SPHERE:_; **AP:_┘**

AP indicates additional points. This is a conditional entry. You do not make an entry in this field when the FSCM is an RFA. When there is an entry in this field, the FLOT is assumed to be incomplete. Legal entry is an X.

6-35. SUPPORT BATTLEFIELD GEOMETRY MESSAGE (SPRT;BGEOM) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SPRT;BGEOM:____/_____;DELETE:_;EDTG:__/__/__,__/__/__;
WIDTH:____;FCORD:_____;APL:_/_/_;
CRD1:__/_____/_____/_____,__/_____/_____/_____;
CRD2:__/_____/_____/_____,__/_____/_____/_____;
CRD3:__/_____/_____/_____,__/_____/_____/_____;
GZ:___;SPHERE:_;AP:_ⅎ
```

---

g. Exploded View. Use the following exploded view as a way to review the message.

```
Message                    Delete        Effective
ID                         indicator     date/time
 \                           |           /
  \                          |          /
SPRT;BGEOM:____/_____;DELETE:_;EDTG:__/__/__,__/__/__;
```

```
Width       Coordinating       Ammunition
of RFA      agency             restrictions
  |           |                  \
  |           |                   \
WIDTH:____;FCORD:_____;APL:_/_/_;
```

```
Point
coordinates
  |
  |
CRD1:__/_____/_____/_____,__/_____/_____/_____;
```

```
Grid       Spheroid       Additional
zone       code           points
  |          |             \
  |          |              \
GZ:___;SPHERE:_;AP:_ⅎ
```

6-36. SUPPORT ZONE MESSAGE (SPRT;ZNE)

a. Purpose. The SPRT;ZNE message is used for operator review and to establish or update a zone of responsibility.

b. Source. The SPRT;ZNE message is displayed from the following summary messages:

- BCS;GEOSUM
- SYS;IQSUM
- SYS;MSGSUM.

c. Input. You enter data concerning a zone of responsibility which includes 3 to 30 points in sequence that do not cross and are within the map mod spheroid, grid zone, and adjacent grid zones.

d. Computer Processing. Pressing the EXEC key causes the data entered in the SPRT;ZNE message to be entered in the support geometry file. The support geometry file can hold one zone of responsibility. Pressing tne DELETE key deletes the specified zone from the file.

e. Output. The number of FSCM's under FC in the middle display is updated. The number of FSCM's in the BCS;DBSUM message is updated.

f. Message Format and Legal Entries. The following SPRT;ZNE message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SPRT;ZNE;NAME:_____;DELETE:_;DTG:__/__/__;
CORD1:__/_____/_______,__/_____/_______,__/_____/_______;
CORD2:__/_____/_______,__/_____/_______,__/_____/_______;
CORD3:__/_____/_______,__/_____/_______,__/_____/_______;
CORD4:__/_____/_______,__/_____/_______,__/_____/_______;
GZ:___;SPHERE:_;AP:_┘
```

SPRT;ZNE;	NAME:_____;DELETE:_;DTG:__/__/__;

SPRT;ZNE identifies the message as the zone of responsibility message.

SPRT;ZNE; | NAME:_____; | DELETE:_;DTG:__/__/__;

NAME indicates the zone of fire name. This is a required entry. Legal entries are one to six alphanumeric characters.

6-36. SUPPORT ZONE MESSAGE (SPRT;ZNE) - CONTINUED

SPRT;ZNE;NAME:_____; **DELETE:_;** DTG:__/__/__;

DELETE is a delete indicator. An entry in this field deletes the zone of responsibility. This field is not used by BCS in processing. Legal entry is an X.

SPRT;ZNE;NAME:_____;DELETE:_; **DTG:__/__/__;**

DTG indicates the date/time group. This field is not used by BCS in processing. Legal entries are:

DTG:__/ __/__;	Day	1 to 31
DTG:__/ **__/** __;	Hour	0 to 23
DTG:__/__/ **__;**	Minute	0 to 59

NOTE

The CORD1 line of the SPRT;ZNE message is described below. The information given is also applicable to the CORD2 through CORD4 line.

CORD1:__/_____/_______,__/_____/_______,__/_____/_______;

CORD1 indicates the coordinates of a point. It is a required entry. If you make an entry in any iteration of CORD1, you must make an entry in all iterations. Legal entries are:

CORD1:__/ _____/_______,	Point number	1 to 30
CORD1:__/ **_____/** _______,	Easting	0 to 999999
CORD1:__/_____/ **_______,**	Northing	0 to 11000000

6-36. SUPPORT ZONE MESSAGE (SPRT;ZNE) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SPRT;ZNE;NAME:_____;DELETE:_;DTG:__/__/__;
CORD1:__/_____/_______,__/_____/_______,__/_____/_______;
CORD2:__/_____/_______,__/_____/_______,__/_____/_______;
CORD3:__/_____/_______,__/_____/_______,__/_____/_______;
CORD4:__/_____/_______,__/_____/_______,__/_____/_______;
GZ:___;SPHERE:_;AP:_┘
```

| GZ:___; | SPHERE:_;AP:_┘

GZ indicates the grid zone. This is an optional entry. Legal entries are -60 to +60 (excluding zero).

GZ:___; | SPHERE:_; | AP:_┘

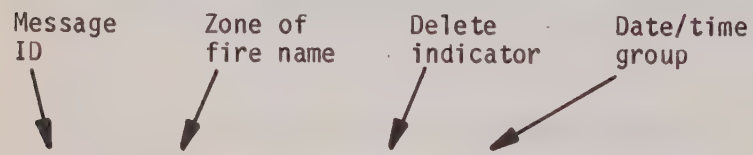
SPHERE indicates the spheroid code. This is an optional entry. Legal entries are 1 to 8.

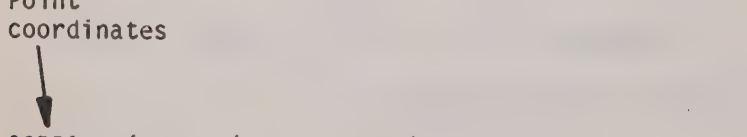
GZ:___;SPHERE:_; | AP:_┘ |

AP indicates additional points. When there is an entry in this field, the zone of responsibility is assumed to be incomplete. This is an optional entry. Legal entry is an X.

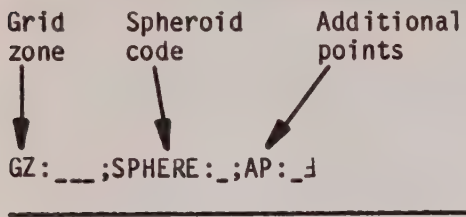
---

g. Exploded View. Use the following exploded view as a way to review the message.





6-36. SUPPORT ZONE MESSAGE (SPRT;ZNE) - CONTINUED



6-37. COMPUTER METEOROLOGICAL DATA MESSAGE (MET;CM)

a. Purpose. The MET;CM message is used for operator review and to enter, update, and transmit meteorological information.

b. Source. The MET;CM message is displayed from the following summary messages:

- BCS;DBSUM
- SYS;MSGSUM
- SYS;IQSUM.

c. Input. You enter meteorological data. Each of the two segments of the MET;CM message can process 15 lines of met. Two segments of the message are required to process the 27 met lines that each met message can store.

d. Computer Processing. Pressing the EXEC key causes the data input to be stored in the met file. If the MET;CM message was displayed from the BCS;DBSUM message (MET1 or MET2) that met message is updated. Otherwise, the met message indicated in the METUPD field of the SYS;SETUP message is updated. (Refer to paragraph 4-10 (non-HIP) or 4-11 (HIP).)

e. Output. Not applicable.

f. Message Format and Legal Entries. The following MET;CM message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
MET;CM;Q:_;POSI:_____;DTI:__/__._/_;HGT:___;ATMS:___;
LINEA:__/___/___/___._/____,__/___/___/___._/____,__/___/___/___._/____;
LINEB:__/___/___/___._/____,__/___/___/___._/____,__/___/___/___._/____;
LINEC:__/___/___/___._/____,__/___/___/___._/____,__/___/___/___._/____;
LINED:__/___/___/___._/____,__/___/___/___._/____,__/___/___/___._/____;
LINEE:__/___/___/___._/____,__/___/___/___._/____,__/___/___/___._/____┘
```

MET;CM;	Q:_;POSI:_____;DTI:__/__._/_;HGT:___;ATMS:___;

MET;CM identifies the message as the computer meteorological data message.

MET;CM; | Q:_; | POSI:_____;DTI:__/__._/_;HGT:___;ATMS:___;

Q indicates the octant. This data is for information only. It is stored in the met file and is not used by the BCS. This is an optional entry. Legal entries are listed in appendix F.

6-37. COMPUTER METEOROLOGICAL DATA MESSAGE (MET;CM) - CONTINUED

MET;CM;Q:_; **POSI:_____;** DTI:__/__._/_;HGT:___;ATMS:___;

POSI indicates the met station position or name. This data is for information only. It is stored in the met file and is not used by the BCS. If the entry in the Q field is 9, this field indicates the met station name. Otherwise, the POSI field indicates latitude and longitude of the met station to the nearest tenth of a degree. This is an optional entry. Legal entries are:

When entry in Q field = 0 - 8	3 digits (latitude expressed to the nearest tenth of a degree)
	3 digits (Longitude expressed to the nearest tenth of a degree. If longitude exceeds 99.9 degrees, the hundreds digit is omitted and will be implied from the octant.)
When entry in Q field = 9	One to six alphanumeric characters (met station name)

Default = VIRGIN (when standard met is in use)

MET;CM;Q:_;POSI:_____; **DTI:__/__._/_;** HGT:___;ATMS:___;

DTI indicates the time of the valid period. This data is for information only. It is stored in a met file but it is not used by the BCS. This is a required entry. Legal entries are:

DTI:__/ __._/_;	Day	1 to 31
DTI:__/ **__._/** _;	Hour (in ZULU time to nearest tenth)	0.0 to 23.9
DTI:__/__._/ **_;**	Length (of valid period of MET data in hours)	0 to 9 1-8 - number of hours of validity 9 - 12-hour validity 0 - indefinite validity

---

6-37. COMPUTER METEOROLOGICAL DATA MESSAGE (MET;CM) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
MET;CM;Q:_;POSI:_____;DTI:__/__._/_;HGT:___;ATMS:___;
LINEA:__/___/___/___._/____,__/___/___/___/___._/____,__/___/___/___/___._/____;
LINEB:__/___/___/___._/____,__/___/___/___/___._/____,__/___/___/___/___._/____;
LINEC:__/___/___/___._/____,__/___/___/___/___._/____,__/___/___/___/___._/____;
LINED:__/___/___/___._/____,__/___/___/___/___._/____,__/___/___/___/___._/____;
LINEE:__/___/___/___._/____,__/___/___/___/___._/____,__/___/___/___/___._/____┘
```

MET;CM;Q:_;POSI:_____;DTI:__/__._/_; **HGT:___;** ATMS:___;

HGT indicates the height of the met station in tens of meters. A positive entry indicates a height above sea level. A negative entry indicates a height below sea level. This is a required entry. Legal entries are -99 to 999.

MET;CM;Q:_;POSI:_____;DTI:__/__._/_;HGT:___; **ATMS:___;**

ATMS indicates atmospheric pressure at the met station in millibars. This is a required entry. The entry for pressure (fifth subfield) in line ØØ must equal the entry in this field. Legal entries are 0 to 999. (If the pressure is greater than or equal to 1000 millibars, the thousands digit is omitted. Therefore, an entry between 000 and 199 represents 1000 to 1199 millibars.)

NOTE

LINEA is described on the following page. The information given also applies to LINEB through LINEE.

6-37. COMPUTER METEOROLOGICAL DATA MESSAGE (MET;CM) - CONTINUED

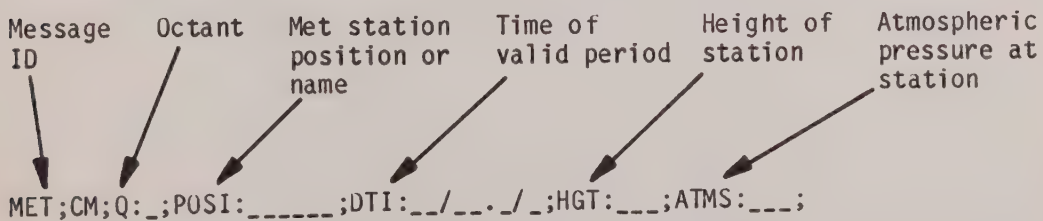
```
LINEA:__/___/___/___._/____,__/___/___/___._/____,__/___/___/___._/____;
```

LINEA indicates a line containing met data. The data given indicates met conditions within a specific altitude band. Each line can contain a maximum of three iterations of met data. If the entry in the first subfield of any iteration is 00, then the entry in the fifth subfield of that iteration must be equal to the entry in the ATMS field. If you make an entry in any subfield of an iteration, then you must make an entry in all subfields for that iteration. This is an optional entry. Legal entries are:

`LINEA:__/ ___/___/___._/____;`	Line number	0 to 26
`LINEA:__/ ___/ ___/___._/____,`	Direction of wind in tens of mils	0 to 640
`LINEA:__/___/ ___/ ___._/____,`	Wind speed in knots	0 to 300
`LINEA:__/___/___/ ___._/ ____,`	Air virtual temperature in tenths of degrees kelvin	0.0 to 500.0
`LINEA:__/___/___/___._/ ____,`	Air pressure in millibars	0 to 1100

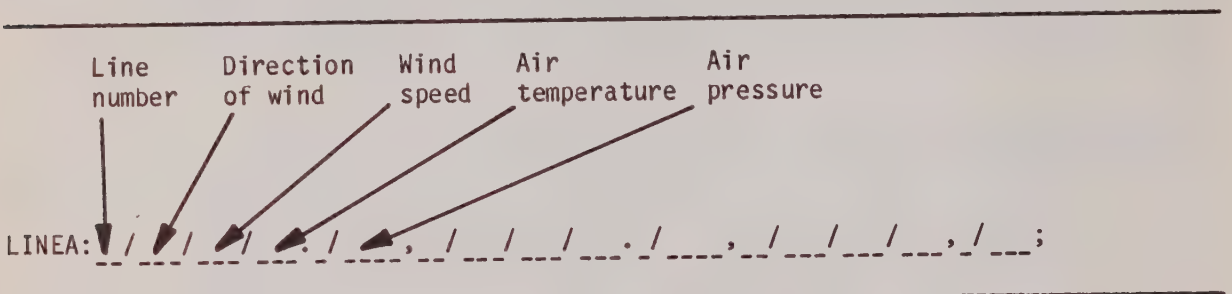
Default = standard met

g. Exploded View. Use the following exploded view as a way to review the message.



6-37. COMPUTER METEOROLOGICAL DATA MESSAGE (MET;CM) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
MET;CM;Q:_;POSI:_____;DTI:__/__._/_;HGT:___;ATMS:___;
LINEA:__/___/___ /__._/____,__/___/___/___._/____,__/___/___/___._/____;
LINEB:__/___/___/___._/____,__/___/___/___._/____,__/___/___/___._/____;
LINEC:__/___/___/___._/____,__/___/___/___._/____,__/___/___/___._/____;
LINED:__/___/___/___._/____,__/___/___/___._/____,__/___/___/___._/____;
LINEE:__/___/___/___._/____,__/___/___/___._/____,__/___/___/___._/____┘
```



6-38. REGISTRATION DATA INPUT MESSAGE (AFU;REG)

a. Purpose. The AFU;REG message is used to display and update data stored in the registration file. It is also used to transmit registration data.

b. Source. The AFU;REG message may be received by BCS from TACFIRE. It may be displayed from the following summary messages:

- BCS;REGSUM
- SYS;MSGSUM
- SYS;IQSUM.

c. Input. The BCS will complete the message with registration data from the registraton file. To update the file, you make entries into the AFU;REG message.

d. Computer Processing. Pressing the EXEC key will update the registration file.

e. Output. The registration file is updated.

f. Message Format and Legal Entries. The following AFU;REG message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained, and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;REG;FU:_/_/_/__/___;SHL:___;LOT:_/_;CHG:_;FZE:____;DELETE:_;
RG:____;RNGCR:_____;TIMECR:__._;DEFLCR:_/___;
STDMET:_;ANGLE:____ITGT:_____;DTG:__/__/__;MET:_;SURP:_;SURT:_;MV:_;
```

AFU;REG;	FU:_/_/_/__/___;SHL:___;LOT:_/_;CHG:_;FZE:____;DELETE:_;

AFU;REG identifies the message as the registration data input message.

6-38. REGISTRATION DATA INPUT MESSAGE (AFU;REG) - CONTINUED

AFU;REG; **FU:_/_/_/__/___;** SHL:___;LOT:_/_;CHG:_;FZE:____;DELETE:_;

FU indicates the fire unit name. This field is automatically filled in by the BCS with the fire unit name entered in the SYS;COMM message. Legal entries are:

FU:_/ _/_/__/___;	Section	One alphabetic or numeric character
FU:_/ **_/** _/__/___;	Platoon	One alphabetic or numeric character
FU:_/_/ **_/** __/___;	Battery	One alphabetic or numeric character
FU:_/_/_/ **__/** ___;	Battalion	One or two alphabetic or numeric characters
FU:_/_/_/__/ **___;**	Regiment	One to three alphabetic or numeric characters

AFU;REG;FU:_/_/_/__/___; **SHL:___;** LOT:_/_;CHG:_;FZE:____;DELETE:_;

SHL indicates the shell category registered. This is a required entry. Legal entries are listed in appendix G.

AFU;REG;FU:_/_/_/__/___;SHL:___; **LOT:_/_** CHG:_;FZE:____;DELETE:_;

LOT indicates the shell and powder lots used. This is a required entry. Legal entries are:

LOT:_/ _;	Shell lot	One alphabetic character
LOT:_/ **_;**	Powder lot*	One alphabetic character

*Powder lot is not used for 105mm weapons or the 14.5mm trainer.

6-38. REGISTRATION DATA INPUT MESSAGE (AFU;REG) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;REG;FU:_/_/_/__/___;SHL:___;LOT:_/_;CHG:_;FZE:____;DELETE:_;
RG:_____;RNGCR:_____;TIMECR:__._;DEFLCR:_/___;
STDMET:_;ANGLE:____ITGT:_____;DTG:__/__/__;MET:_;SURP:_;SURT:_;MV:_;
```

AFU;REG;FU:_/_/_/__/___;SHL:___;LOT:_/_; **CHG:_;** FZE:____;DELETE:_;

CHG indicates the charge number fired. This is a required entry. Legal entries are listed in appendix G.

AFU;REG;FU:_/_/_/__/___;SHL:___;LOT:_/_;CHG:_; **FZE:____;** DELETE:_;

FZE indicates the fuze type fired. This is a required entry. Legal entries are listed in appendix G.

AFU;REG;FU:_/_/_/__/___;SHL:___;LOT:_/_;CHG:_;FZE:____; **DELETE:_;**

DELETE indicates a deletion. This field is used to notify TACFIRE to delete this set of registration corrections from their data base. This is an optional entry. To delete an AFU;REG message from the file, display the message and press the DELETE key. Legal entry is an X.

RG:_____; RNGCR:_____;TIMECR:__._;DEFLCR:_/___;

RG indicates range in meters. This is a required entry. Legal entries are 0 to 99999.

RG:_____; **RNGCR:_____;** TIMECR:__._;DEFLCR:_/___;

RNGCR indicates the range correction in meters. This is a required entry. Legal entries are -999 to +999.

RG:_____;RNGCR:_____; **TIMECR:__._;** DEFLCR:_/___;

TIMECR indicates the time correction in seconds. Legal entries are -9.9 to +9.9.

6-38. REGISTRATION DATA INPUT MESSAGE (AFU;REG) - CONTINUED

RG:_____;RNGCR:_____;TIMECR:__._; **DEFLCR:_/___;**

DEFLCR indicates the deflection correction in mils. This is a required entry. Legal entries are:

DEFLCR:_/ ___;	Direction	R (right) or L (left)
DEFLCR:_/ ___;	Correction in mils	0 to 999

STDMET:_; ANGLE:____ꟻTGT:_____;DTG:__/__/__;MET:_;SURP:_;SURT:_;MV:_;

STDMET indicates that standard met is being used. If no entry is made, current met is used. Legal entry is an X.

STDMET:_; **ANGLE:____ꟻ** TGT:_____;DTG:__/__/__;MET:_;SURP:_;SURT:_;MV:_;

ANGLE indicates angle of fire. If not indicated otherwise, the registration will be conducted at low angle. This is a required entry. Legal entries are HIGH or LOW.

STDMET:_;ANGLE:____ꟻ **TGT:_____;** DTG:__/__/__;MET:_;SURP:_;SURT:_;MV:_;

TGT indicates the target fired on during the registration mission which resulted in the registration corrections displayed in this message. Data in this field will not be transmitted or displayed in a message received in the input queue. This is a protected entry which you cannot change. Values displayed are two alphabetic characters followed by four numeric characters.

6-38. REGISTRATION DATA INPUT MESSAGE (AFU;REG) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;REG;FU:_/_/_/__/___;SHL:___;LOT:_/_;CHG:_;FZE:____;DELETE:_;
RG:_____;RNGCR:_____;TIMECR:__._;DEFLCR:_/___;
STDMET:_;ANGLE:____ЭTGT:_____;DTG:__/__/__;MET:_;SURP:_;SURT:_;MV:_;
```

STDMET:_;ANGLE:____ЭTGT:_____; **DTG:__/__/__;** MET:_;SURP:_;SURT:_;MV:_;

DTG indicates the date/time group. This field is used to display the system time when the registration was added to the file. Legal entries are:

DTG:__/ __/__;	Day	1 to 31
DTG:__/ **__/** __;	Hour	0 to 23
DTG:__/__/ **__;**	Minute	0 to 59

STDMET:_;ANGLE:____ЭTGT:_____;DTG:__/__/__; **MET:_;** SURP:_;SURT:_;MV:_;

MET indicates a met registration correction update indicator. Legal entry is an X.

STDMET:_;ANGLE:____ЭTGT:_____;DTG:__/__/__;MET:_; **SURP:_;** SURT:_;MV:_;

SURP indicates a position (howitzer) area survey registration correction update indicator. Legal entry is an X.

STDMET:_;ANGLE:____ЭTGT:_____;DTG:__/__/__;MET:_;SURP:_; **SURT:_;** MV:_;

SURT indicates a target area survey registration correction update indicator. Legal entry is an X.

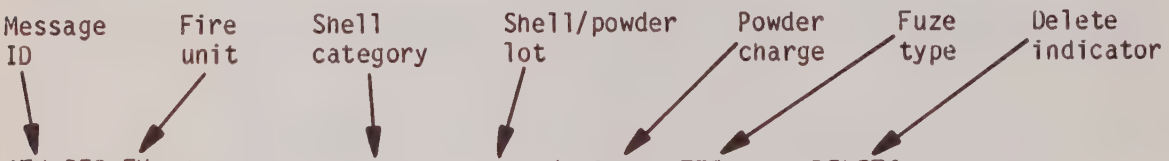
STDMET:_;ANGLE:____ЭTGT:_____;DTG:__/__/__;MET:_;SURP:_;SURT:_; **MV:_;**

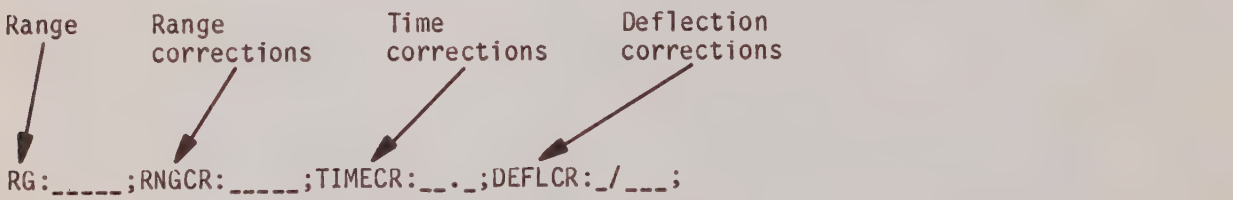
MV indicates the muzzle velocity registration correction update indicator. Legal entry is an X.

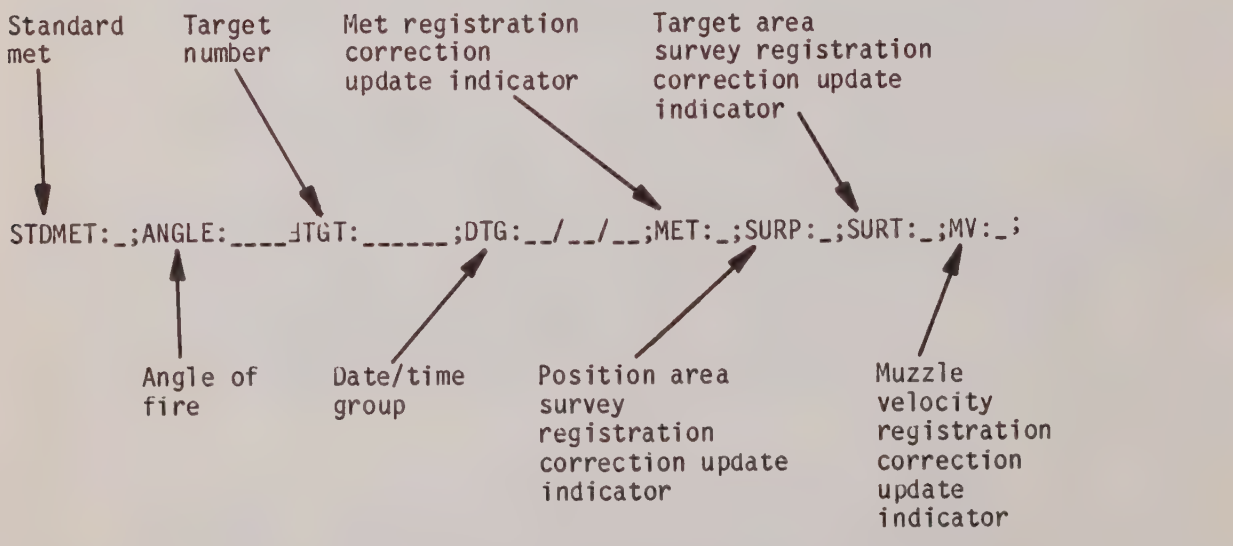
6-38. REGISTRATION DATA INPUT MESSAGE (AFU;REG) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;REG;FU:_/_/_/__/___;SHL:___;LOT:_/_;CHG:_;FZE:____;DELETE:_;
RG:_____;RNGCR:_____;TIMECR:__._;DEFLCR:_/___;
STDMET:_;ANGLE:____ƎTGT:_____;DTG:__/__/__;MET:_;SURP:_;SURT:_;MV:_;
```

g. Exploded View. Use the following exploded view as a way to review the message.







6-39. SUPPORT LOCATE MESSAGE (SPRT;LOC)

a. Purpose. The SPRT;LOC message is for operator review and is used to determine, enter, or delete an observer's location. The methods used for determining an observer's location are trilateration, resection, and triangulation. This message is not transmittable.

b. Source. The SPRT;LOC message is displayed from the following summary messages:

- SYS;IQSUM
- SYS;MSGSUM.

c. Input. You enter data concerning the observer, such as coordinates, altitude, grid zone, known points, target number, and vertical angle. The information entered is determined by the method used to locate the observer. Refer to appendix K for more information.

d. Computer Processing. Pressing the EXEC key causes the data entered to be computed and the observer location to be determined. The data in the observer file is updated. If the method is TRILAT and both points are not present in the first message, the mission will be placed in a current mission buffer. Pressing the DELETE key will delete the mission from the current mission buffer.

e. Output. An FM;OBCO message is generated for transmission when a successful solution is determined. For trilateration missions, a SYS;PTM message is also generated with the computed direction to the left reference point. The observer file and the upper display are updated.

f. Message Format and Legal Entries. The following SPRT;LOC message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SPRT;LOC;OB:__;FST:__;METHOD:_____;
TGTLF:_____;KNPTLF:__;CORDLF:_____/_______/_____;GZLF:___;
DIRLF:____;DISTLF:____;VALF:_____;
TGTRT:_____;KNPTRT:__;CORDRT:_____/_______/_____;GZRT:___;
DIRRT:____;DISTRT:____;VART:_____
```

SPRT;LOC;	OB:__;FST:__;METHOD:_____;

SPRT;LOC identifies the message as the observer location message.

6-39. SUPPORT LOCATE MESSAGE (SPRT;LOC) - CONTINUED

SPRT;LOC; **OB:__;** FST:__;METHOD:_____;

OB indicates the observer identity number. This is the observer being located. This is a conditional entry. You must make an entry in this field if there is no entry in FST. Legal entries are 0 to 99.

SPRT;LOC;OB:__; **FST:__;** METHOD:_____;

FST indicates the FIST identity number. This is the FIST being located if there is no observer specified. Otherwise, it is the FIST acting as the relayer. This is a conditional entry. If OB is blank, you must make an entry in this field. Legal entries are 0 to 99.

SPRT;LOC;OB:__;FST:__; **METHOD:_____;**

METHOD indicates the location technique. It specified the method used to locate the observer or the FIST. It is a required entry. Legal entries are:

TRILAT - Trilateration
TRIANG - Triangulation
RESECT - Resection

TGTLF:_____; KNPTLF:__;CORDLF:_____/_____/_____;GZLF:___;

TGTFL indicates the left or only point target number. It is used as the first reference point. This is a conditional entry. You do not make an entry in this field if there is an entry in KNPTLF or CORDLF. Refer to appendix K for more information. Legal entries are two alphabetic followed by four numeric characters.

TGTLF:_____; **KNPTLF:__;** CORDLF:_____/_____/_____;GZLF:___;

KNPTLF indicates the left or only point known point number. It is used as the first reference point. This is a conditional entry. You do not make an entry in this field if there is an entry in TGTLF or CORDLF. Refer to appendix K for more information. Legal entries are 1 to 99.

6-39. SUPPORT LOCATE MESSAGE (SPRT;LOC) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SPRT;LOC;OB:__;FST:__;METHOD:_____;
TGTLF:_____;KNPTLF:__;CORDLF:_____/_______/_____;GZLF:___;
DIRLF:____;DISTLF:____;VALF:_____;
TGTRT:_____;KNPTRT:__;CORDRT:_____/_______/_____;GZRT:___;
DIRRT:____;DISTRT:____;VART:_____
```

TGTLF:_____;KNPTLF:__; **CORDLF:_____/_______/_____;** GZLF:___;

CORDLF indicates the location of the left or only point in UTM coordinates. It is used as the first reference point. This is a conditional entry. You do not make an entry in this field if there is an entry in TGTLF or KNPTLF. If you make an entry in one subfield, you must make an entry in all subfields. Refer to appendix K for more information. Legal entries are:

CORDLF:_____/ _______/_____;	Easting	0 to 999999
CORDLF:_____/ **_______/** _____;	Northing	0 to 11000000
CORDLF: _____/_______/ **_____;**	Altitude	-9999 to +9999

TGTLF:_____;KNPTLF:__;CORDLF:_____/_______/_____; **GZLF:___;**

GZLF indicates the grid zone of CORDLF. This is an optional entry. You do not make an entry in this field if CORDLF is blank. Legal entries are -60 to +60 (excluding zero).

DIRLF:____; DISTLF:____;VALF:_____;

DIRLF indicates the direction to the left or only point. It is the direction in mils to the left to the first reference point. This is a conditional entry. Refer to appendix K for more information. Legal entries are 0 to 6399.

DIRLF:____; **DISTLF:____;** VALF:_____;

DISTLF indicates the distance to the left or only point. It is the distance in meters to the first reference point. This is a conditional entry. Refer to appendix K for more information. Legal entries are 10 to 9999.

6-39. SUPPORT LOCATE MESSGE (SPRT;LOC) - CONTINUED

DIRLF:____;DISTLF:____; **VALF:_____;**

VALF indicates the vertical angle to the left or only point. It is the vertical angel in mils to the first reference point. This is a conditional entry. Refer to appendix K for more information. Legal entries are -1600 to +1600.

TGTRT:_____; KNPTRT:__;CORDRT:_____/_______/_____;GZRT:___;

TGTRT indicates the right point target number. This is the second reference point. This is a conditional entry. You do not make an entry in this field if there is an entry in TGTRT or KNPTRT. Refer to appendix K for more information. Legal entries are two alphabetic followed by four numeric characters.

TGTRT:_____; **KNPTRT:__;** CORDRT:_____/_______/_____;GZRT:___;

KNPTRT indicates the right point known point number. This is the second reference point. This is a conditional entry. You do not make an entry in this field if there is an entry in TGTRT or CORDRT. Refer to appendix K for more information. Legal entries are 1 to 99.

TGTRT:_____;KNPTRT:__; **CORDRT:_____/_______/_____;** GZRT:___;

CORDRT indicates the location of the right point. This is the second reference point. This is a conditional entry. You do not make an entry in this field if there is an entry in TGTRT or KNPTRT. If you make an entry in one subfield, you must make an entry in all subfields. Refer to appendix K for more information. Legal entries are:

CORDRT:_____/ _______/_____;	Easting	0 to 999999
CORDRT:_____/ **_______/** _____;	Northing	0 to 11000000
CORDRT:_____/_______/ **____;**	Altitude	-9999 to +9999

6-39. SUPPORT LOCATE MESSAGE (SPRT;LOC) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SPRT;LOC;OB:__;FST:__;METHOD:_____;
TGTLF:_____;KNPTLF:__;CORDLF:_____/_______/_____;GZLF:___;
DIRLF:____;DISTLF:____;VALF:_____;
TGTRT:_____;KNPTRT:__;CORDRT:_____/_______/_____;GZRT:___;
DIRRT:____;DISTRT:____;VART:_____┘
```

TGTRT:_____;KNPTRT:__;CORDRT:_____/_______/_____; **GZRT:___;**

GZRT indicates the grid zone of CORDRT. This is an optional entry. Legal entries are -60 to +60 (excluding zero).

DIRRT:____; DISTRT:____;VART:_____┘

DIRRT indicates the direction to the right point. This is the direction in mils to the second reference point. This is a conditional entry. Refer to appendix K for more information. Legal entries are 0 to 6399.

DIRRT:____; **DISTRT:____;** VART:_____┘

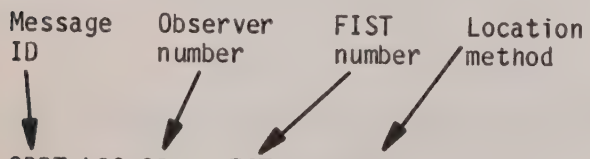
DISTRT indicates the distance to the right point. This is the distance in meters to the right reference point. This is a conditional entry. Refer to appendix K for more information. Legal entries are 10 to 9999.

DIRRT:____;DISTRT:____; **VART:_____┘**

VART indicates the vertical angle to the right point. This is the vertical angle in mils to the second reference point. This is an optional entry. The right vertical angle is not used in triangulation missions. Legal entries are -1600 to +1600.

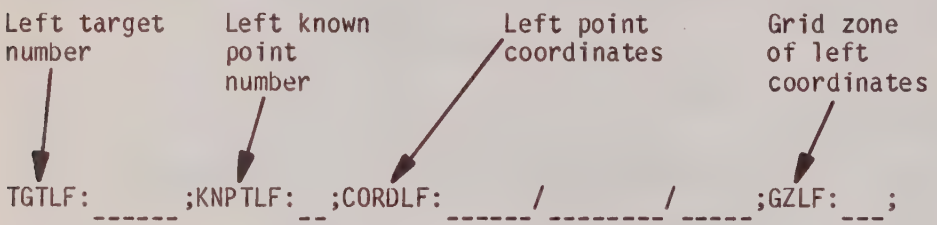
---

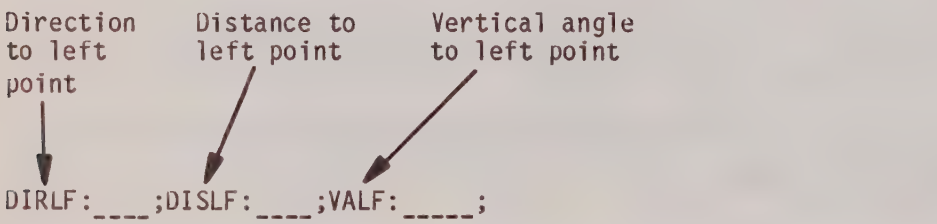
g. Exploded View. Use the following exploded view as a way to review the message.

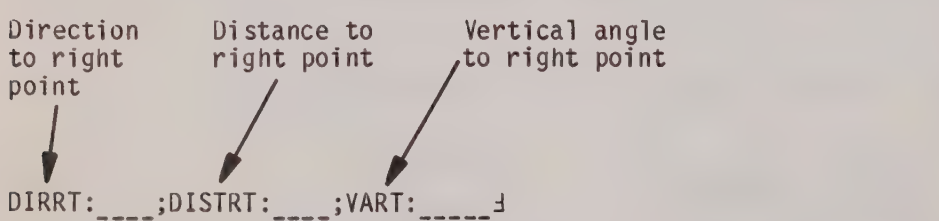


6-39. SUPPORT LOCATE MESSGE (SPRT;LOC) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SPRT;LOC;OB:__;FST:__;METHOD:_____;
TGTLF:_____;KNPTLF:__;CORDLF:_____/_______/_____;GZLF:___;
DIRLF:____;DISTLF:____;VALF:_____;
TGTRT:_____;KNPTRT:__;CORDRT:_____/_______/_____;GZRT:___;
DIRRT:____;DISTRT:____;VART:_____ǂ
```







CHAPTER 7

REQUESTS AND SPECIAL REPORTS

OVERVIEW

This chapter describes special reports.

Section I provides general information about each type of request and special report.

Section II provides flowcharts to show you how to process requests and special report messages.

Section III provides specific information about message formats. The message formats are shown as they appear on the lower display of the BCU. An explanation of the mnemonics used and the legal data entries is also provided.

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Section I. GENERAL INFORMATION

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7-1. REQUESTS AND SPECIAL REPORTS

Some message formats used by the BCS are called requests or special reports. They do not add to or change information in the data base. They are simply used to transmit information from one computer to another. There are 11 messages of this kind: the system plain text message, the three artillery target intelligence messages, the support Mark/MOD message, the current muzzle velocity message (AFU;MV), the nuclear/nonnuclear fire plan, fire plan target update message, the system message format request message, the movement orders message, and the request for data message. These messages only provide information. If you try to execute one of them, an error message will be displayed. Information in these messages is not stored in the data base.

The SYS;RING message is a request message. Executing the SYS;RING message does not affect the data base. You use it to request voice communication with the howitzers. The howitzers use it to request voice communication with you. The following paragraphs provide a brief description of these requests and special reports message formats and how they are used.

7-2. SYSTEM PLAIN TEXT MESSAGE (SYS;PTM)

Most of the information you need to accomplish tactical fire direction will be received or transmitted in specially formatted messages. However, there are times when you must transmit data that will not fit into a specific message format. At

7-2. SYSTEM PLAIN TEXT MESSAGE (SYS;PTM) - CONTINUED

these times you will use the system plain text message (SYS;PTM). You can use the SYS;PTM message to communicate digitally with anyone listed in your subscriber table. The SYS;PTM message is an open or free text message format. You can enter any alphanumeric character into the spaces provided. You can enter a maximum of 424 characters into the SYS;PTM message format. However, messages to DMD's are limited to a maximum of 37 characters. If a SYS;PTM message is to be transmitted to a Firefinder radar, you may be required to encode the message. The first two characters are used for the encode key. Your OPORD and SOP's will suggest uses for the SYS;PTM message.

7-3. ARTILLERY TARGET INTELLIGENCE (ATI) MESSAGES (ATI;AZR, ATI;CDR, AND ATI;SHR)

Like the SYS;PTM message, the Artillery Target Intelligence (ATI) messages cannot be executed. They are used to display and/or transmit tactical information. The information contained in the ATI messages is used by the receiving operator to update his data base. He does this by entering the information into other appropriate message formats and executing them. The following subparagraphs provide a brief description of each of the three ATI messages:

a. ATI;CDR (Coordinates Report). The ATI;CDR message is used to display information about a target and to define its location by grid coordinates. It can also be used to request fire on a target by another battery through TACFIRE.

b. ATI;AZR (Azimuth-Distance Report). The ATI;AZR message is used to display information about a target and to define its location by means of direction and distance from an observer's location.

c. ATI;SHR (Shell Report). The ATI;SHR message provides an indication of enemy shelling activity.

7-4. SYSTEM RING MESSAGE (SYS;RING) (NON-HIP)

The SYS;RING message is the only message discussed in this chapter which can be executed. Executing the SYS;RING message sends a "ring" to specified howitzers or all howitzers, telling them you wish to engage in voice communication with them. BCS must execute the SYS;RING message before the howitzer can "ring" the BCS. When you receive a SYS;RING message from a howitzer, you know that the howitzer wishes voice communications.

7-5. SUPPORT MARK/MOD MESSAGE (SPRT;MRKMOD)

The SPRT;MRKMOD message is received from TACFIRE and is used to display Mark/MOD data for nuclear fire missions.

7-6. CURRENT MUZZLE VELOCITY MESSAGE (AFU;MV)

The AFU;MV message is used to send average fire unit muzzle velocities to TACFIRE. TACFIRE will store the received muzzle velocities, but does not use them in processing. You will complete and transmit this message.

7-7. NUCLEAR/NONNUCLEAR FIRE PLAN, FIRE PLAN TARGET UPDATE MESSAGE (NNFP;FPTU)

The NNFP;FPTU message is used for relay only. Normally, you will receive this message from a TFDMD or FIST DMD and it will be transmitted to TACFIRE automatically. Under normal circumstances, you will not see this message. Therefore, you will make no entries into it. It is not executable.

7-8. SYSTEM MESSAGE FORMAT REQUEST MESSAGE (SYS;FORM)

This message is used by remote subscribers (a VFMED) to request blank message skeleton formats from BCS. Upon receipt of this message, the BCS will automatically generate the requested blank format and transmit it to the subscriber who requested the message skeleton. If a SYS;FORM is received requiring manual authentication, refer to paragraph 3-22. Under normal circumstances, you will not see this message. If you receive a SYS;FORM message requesting a classified message skeleton and the communication net is unencrypted, you must override by entering an O in the A field of the comm line.

The message skeletons which may be requested using a SYS;FORM message are listed below.

- SYS;PTM
- MET;CM
- FM;RFAF
- FM;SUBS
- FM;FC
- FM;EOM
- FM;INTM
- SPRT;MRKMOD
- SPRT;GEOM
- SPRT;MAP
- FM;MTO
- ATI;CDR
- ATI;SHR
- ATI;AZR
- NNFP;FC
- NNFP;FPTU
- FM;HBMPI
- FM;QF
- FM;CHECK
- FM;OBCO
- FM;FOCMD
- FM;FIRE
- AFU;MV
- AFU;UPDATE
- AFU;BAMOUP
- AFU;REG
- AFU;MASK
- COMD;CC
- COMD;CF
- SPRT;ZONE
- SPRT;LOC

7-9. MOVEMENT ORDERS MESSAGE (HOW;MOVE) (HIP)

The HOW;MOVE message is transmitted from platoon BCS to the howitzer to control or direct movement to or within a firing area, initialization point, or resupply point. The HOW;MOVE message is also used to direct that a howitzer remain at its present location.

7-10. REQUEST FOR DATA MESSAGE (HOW;REQUST) (HIP)

The HOW;REQUST message is used to request blank message formats or missing data base information from BCS or the howitzers. Upon execution of this message, the BCS or the howitzer will automatically generate the requested message.

Section II. REQUESTS AND SPECIAL REPORTS FLOWCHARTS

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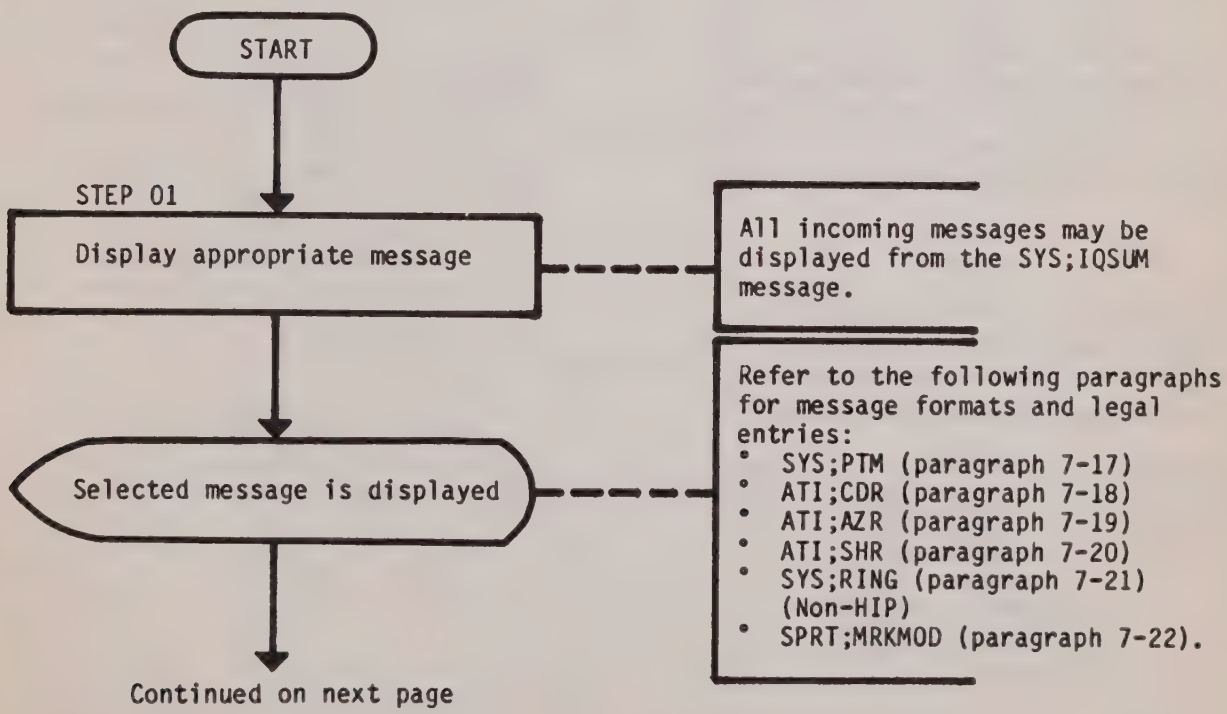
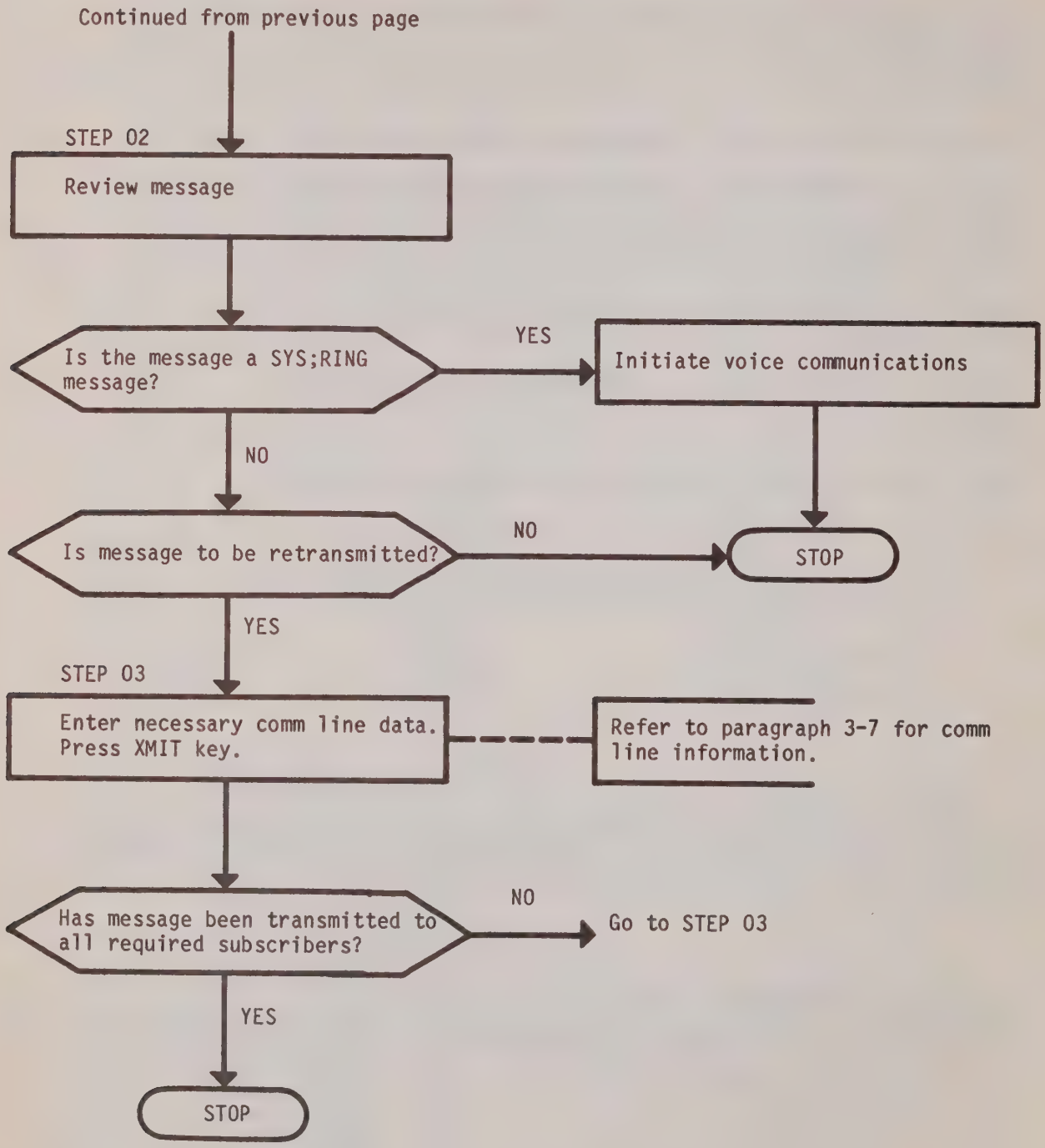
7-11. PROCESSING INCOMING REQUEST AND SPECIAL REPORT MESSAGES

Use this flowchart to perform the following tasks:

- Process Plain Text Information Using the SYS;PTM Message.
- Process Artillery Target Intelligence Information.


START
STEP 01
Display appropriate message
All incoming messages may be displayed from the SYS;IQSUM message.
Selected message is displayed
Refer to the following paragraphs for message formats and legal entries:
• SYS;PTM (paragraph 7-17)
• ATI;CDR (paragraph 7-18)
• ATI;AZR (paragraph 7-19)
• ATI;SHR (paragraph 7-20)
• SYS;RING (paragraph 7-21) (Non-HIP)
• SPRT;MRKMOD (paragraph 7-22).
Continued on next page

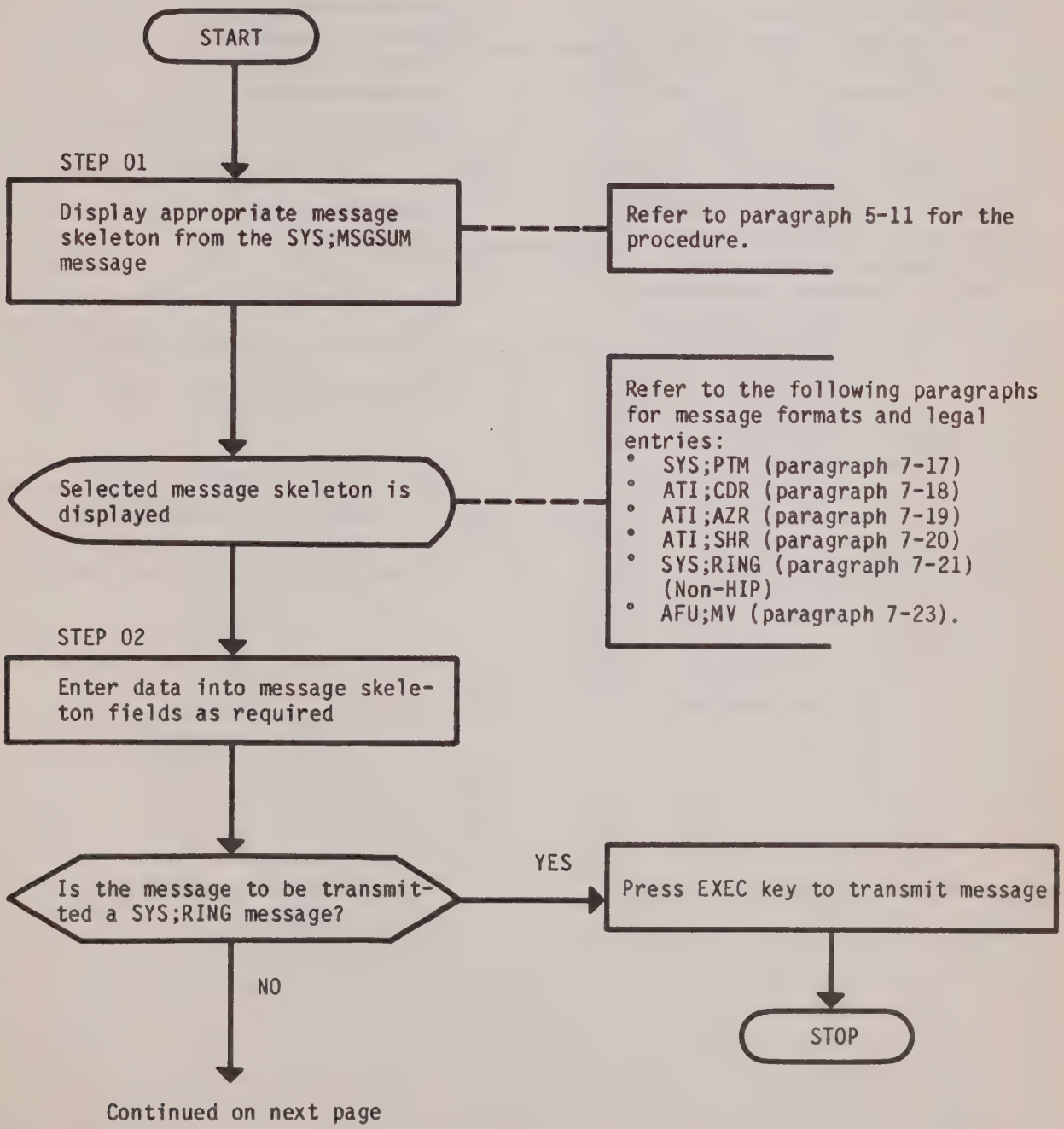
7-11. PROCESSING INCOMING REQUEST AND SPECIAL REPORT MESSAGES - CONTINUED



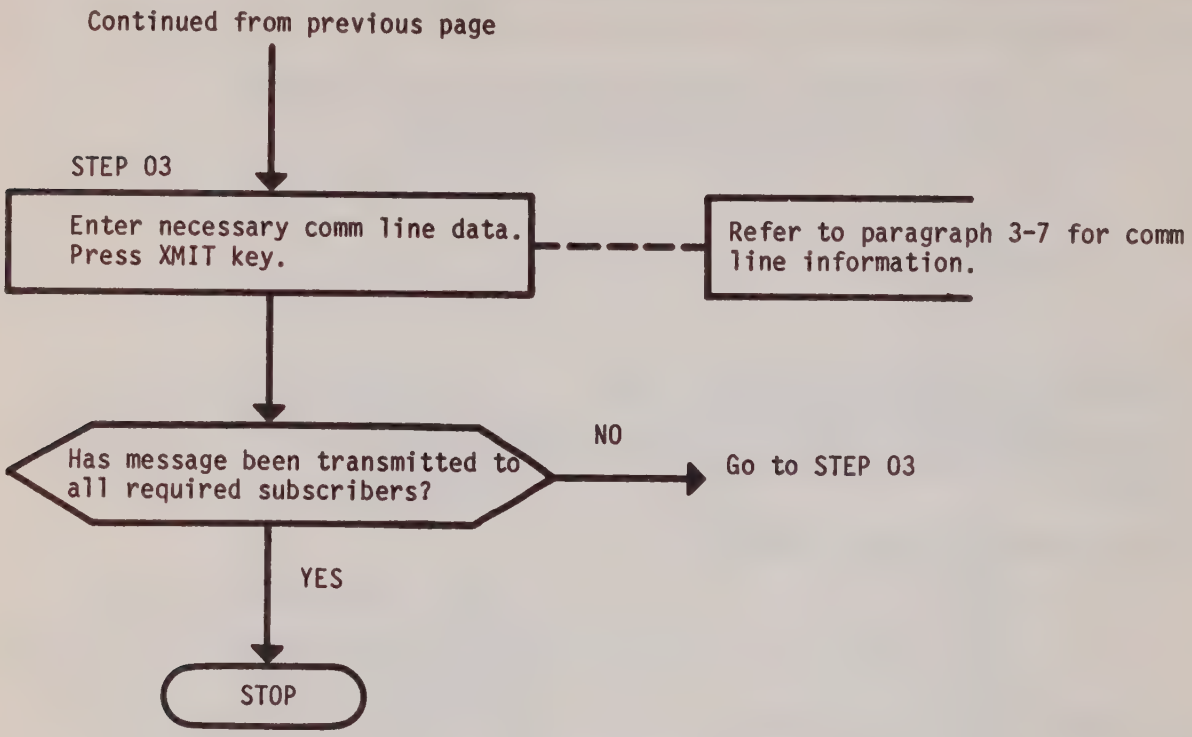
7-12. PROCESSING OUTGOING REQUEST AND SPECIAL REPORT MESSAGES

Use this flowchart to perform the following tasks:

- Process Muzzle Velocity Information Using the AFU;MV Message.
- Process Plain Text Information Using the SYS;PTM Message.
- Process Artillery Target Intelligence Information.


START
STEP 01
Display appropriate message skeleton from the SYS;MSGSUM message
Refer to paragraph 5-11 for the procedure.
Selected message skeleton is displayed
Refer to the following paragraphs for message formats and legal entries:
° SYS;PTM (paragraph 7-17)
° ATI;CDR (paragraph 7-18)
° ATI;AZR (paragraph 7-19)
° ATI;SHR (paragraph 7-20)
° SYS;RING (paragraph 7-21) (Non-HIP)
° AFU;MV (paragraph 7-23).
STEP 02
Enter data into message skeleton fields as required
Is the message to be transmitted a SYS;RING message?
YES
Press EXEC key to transmit message
STOP
NO
Continued on next page

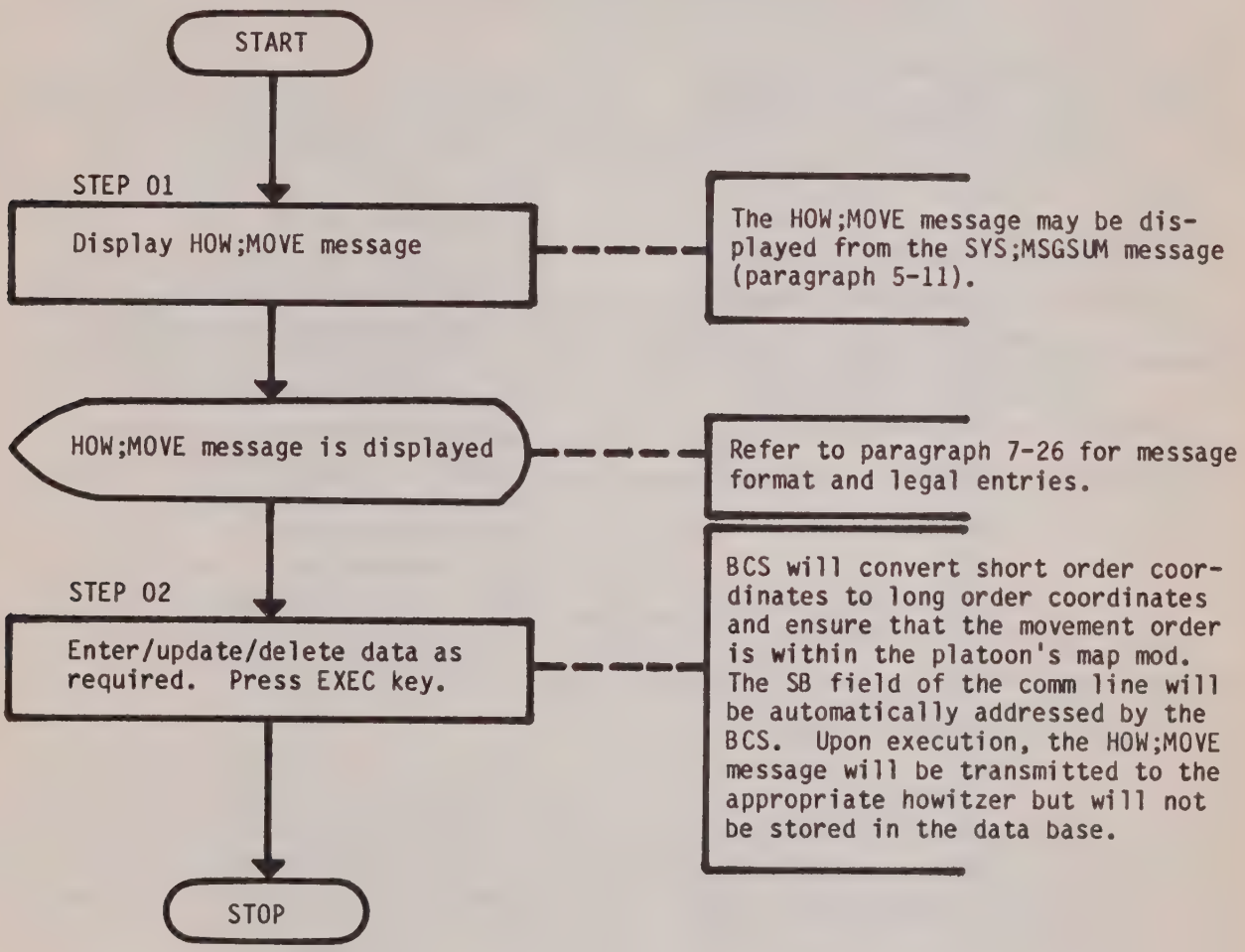
7-12. PROCESSING OUTGOING REQUEST AND SPECIAL REPORT MESSAGES - CONTINUED


Continued from previous page
STEP 03
Enter necessary comm line data. Press XMIT key.
Refer to paragraph 3-7 for comm line information.
Has message been transmitted to all required subscribers?
NO
Go to STEP 03
YES
STOP

7-13. PROCESSING A MOVEMENT ORDER USING THE HOW;MOVE MESSAGE (HIP)

Use this flowchart to perform the following task:

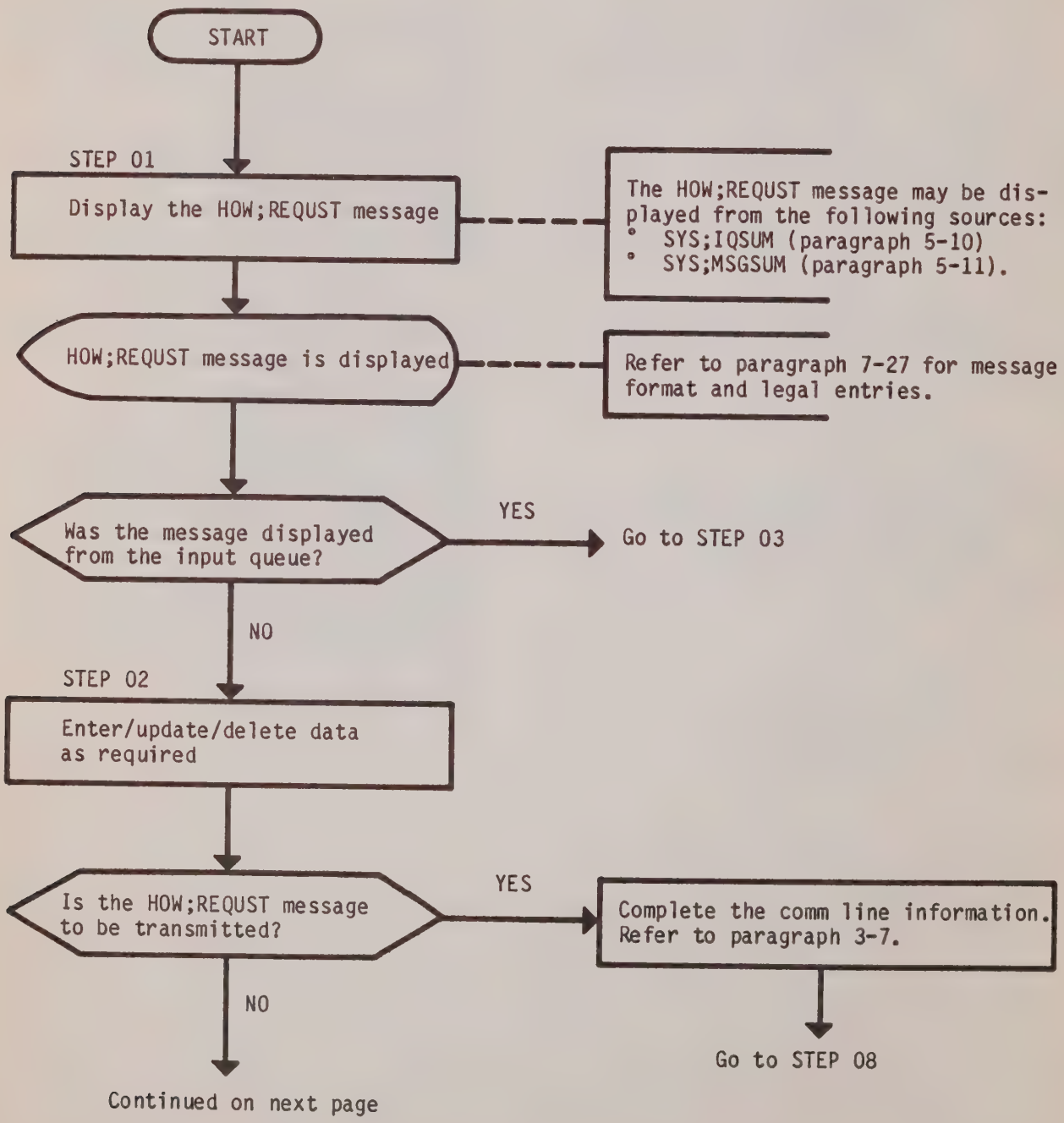
- Process a Movement Order Using the HOW;MOVE Message (HIP).


START
STEP 01
Display HOW;MOVE message
The HOW;MOVE message may be displayed from the SYS;MSGSUM message (paragraph 5-11).
HOW;MOVE message is displayed
Refer to paragraph 7-26 for message format and legal entries.
STEP 02
Enter/update/delete data as required. Press EXEC key.
BCS will convert short order coordinates to long order coordinates and ensure that the movement order is within the platoon's map mod. The SB field of the comm line will be automatically addressed by the BCS. Upon execution, the HOW;MOVE message will be transmitted to the appropriate howitzer but will not be stored in the data base.
STOP

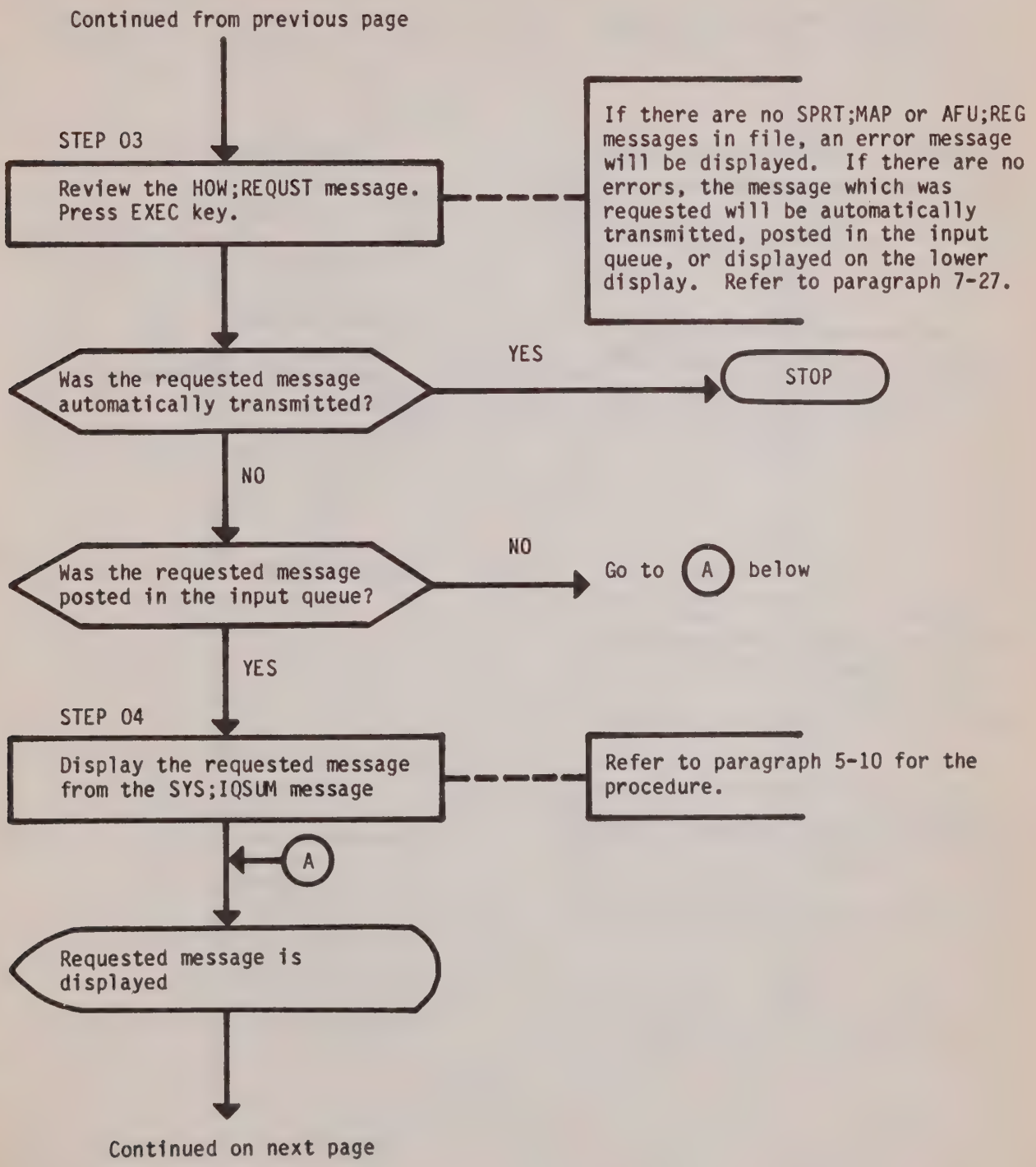
7-14. PROCESSING A REQUEST FOR DATA BASE INFORMATION USING THE HOW;REQUST MESSAGE (HIP)

Use this flowchart to perform the following task:

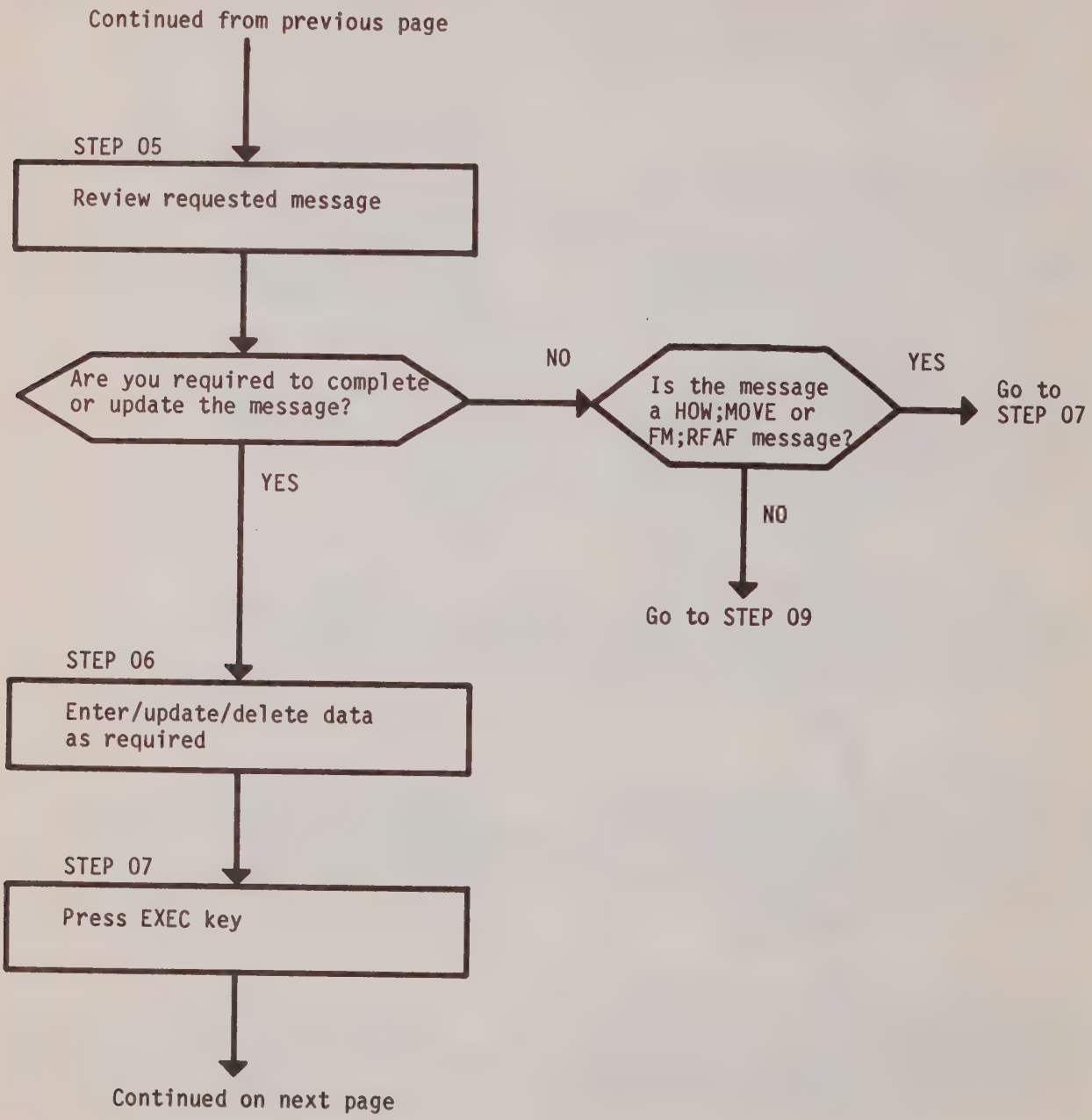
- Process a Request for Data Base Information Using the HOW;REQUST Message (HIP).


START
STEP 01
Display the HOW;REQUST message
The HOW;REQUST message may be displayed from the following sources:
° SYS;IQSUM (paragraph 5-10)
° SYS;MSGSUM (paragraph 5-11).
HOW;REQUST message is displayed
Refer to paragraph 7-27 for message format and legal entries.
Was the message displayed from the input queue?
YES
Go to STEP 03
NO
STEP 02
Enter/update/delete data as required
Is the HOW;REQUST message to be transmitted?
YES
Complete the comm line information. Refer to paragraph 3-7.
NO
Go to STEP 08
Continued on next page

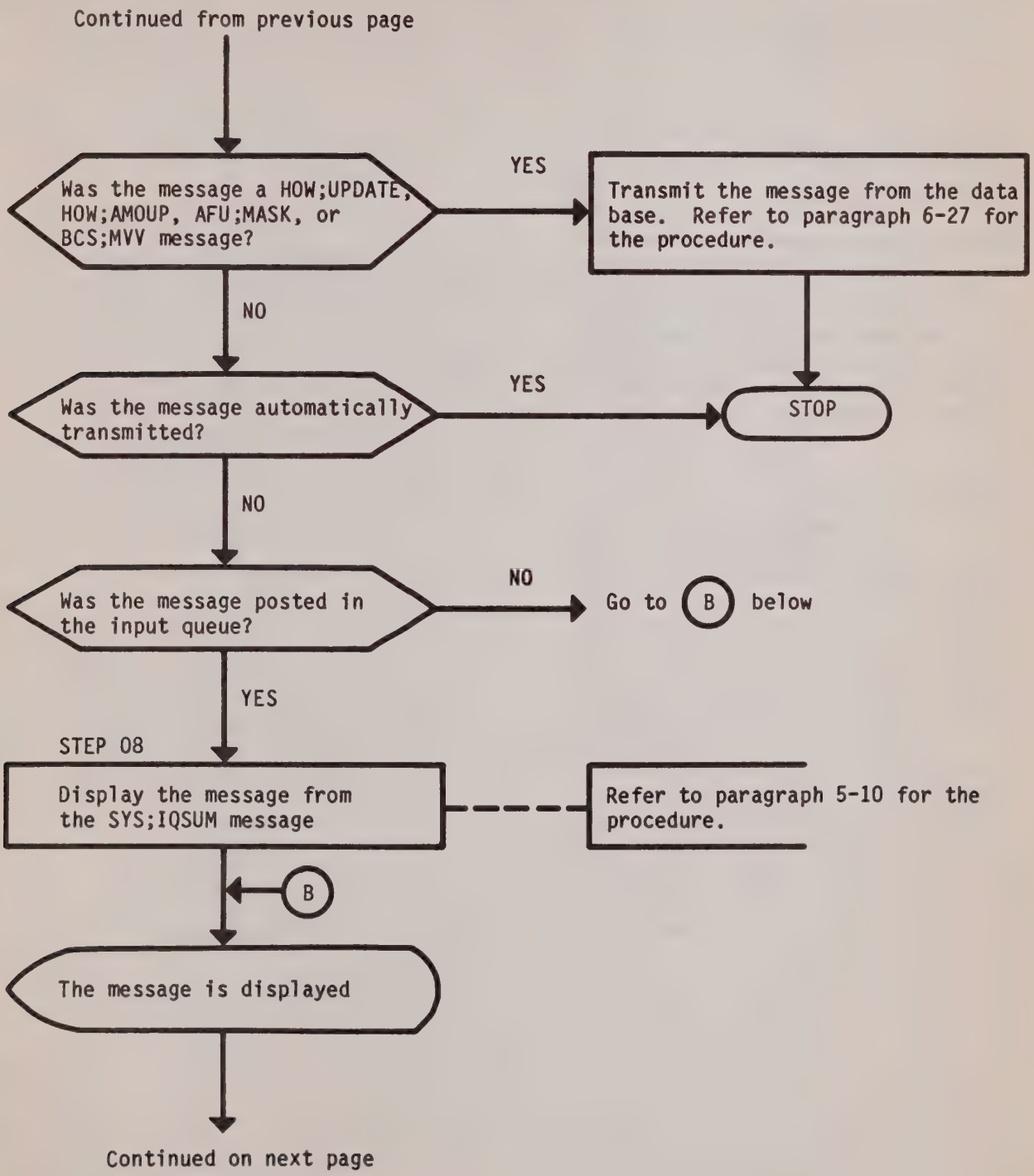
7-14. PROCESSING A REQUEST FOR DATA BASE INFORMATION USING THE HOW;REQUST MESSAGE (HIP) - CONTINUED


Continued from previous page
STEP 03
Review the HOW;REQUST message. Press EXEC key.
If there are no SPRT;MAP or AFU;REG messages in file, an error message will be displayed. If there are no errors, the message which was requested will be automatically transmitted, posted in the input queue, or displayed on the lower display. Refer to paragraph 7-27.
Was the requested message automatically transmitted?
YES
STOP
NO
Was the requested message posted in the input queue?
NO
Go to A below
YES
STEP 04
Display the requested message from the SYS;IQSUM message
Refer to paragraph 5-10 for the procedure.
A
Requested message is displayed
Continued on next page

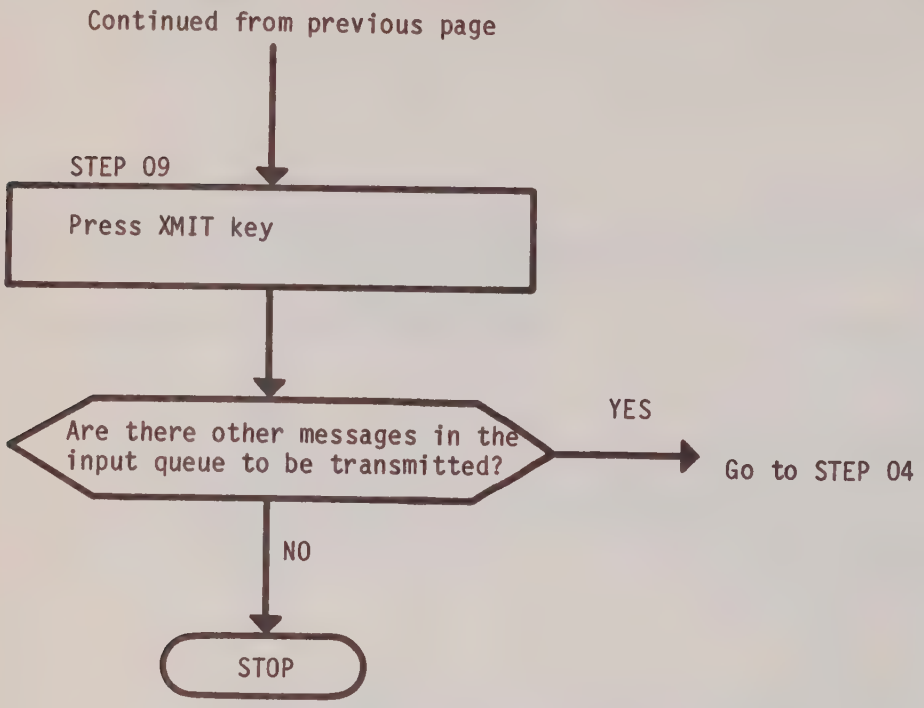
7-14. PROCESSING A REQUEST FOR DATA BASE INFORMATION USING THE HOW;REQUST MESSAGE (HIP) - CONTINUED



7-14. PROCESSING A REQUEST FOR DATA BASE INFORMATION USING THE HOW;REQUST MESSAGE (HIP) - CONTINUED


Continued from previous page
Was the message a HOW;UPDATE, HOW;AMOUP, AFU;MASK, or BCS;MVV message?
YES
Transmit the message from the data base. Refer to paragraph 6-27 for the procedure.
NO
Was the message automatically transmitted?
YES
STOP
NO
Was the message posted in the input queue?
NO
Go to B below
YES
STEP 08
Display the message from the SYS;IQSUM message
Refer to paragraph 5-10 for the procedure.
B
The message is displayed
Continued on next page

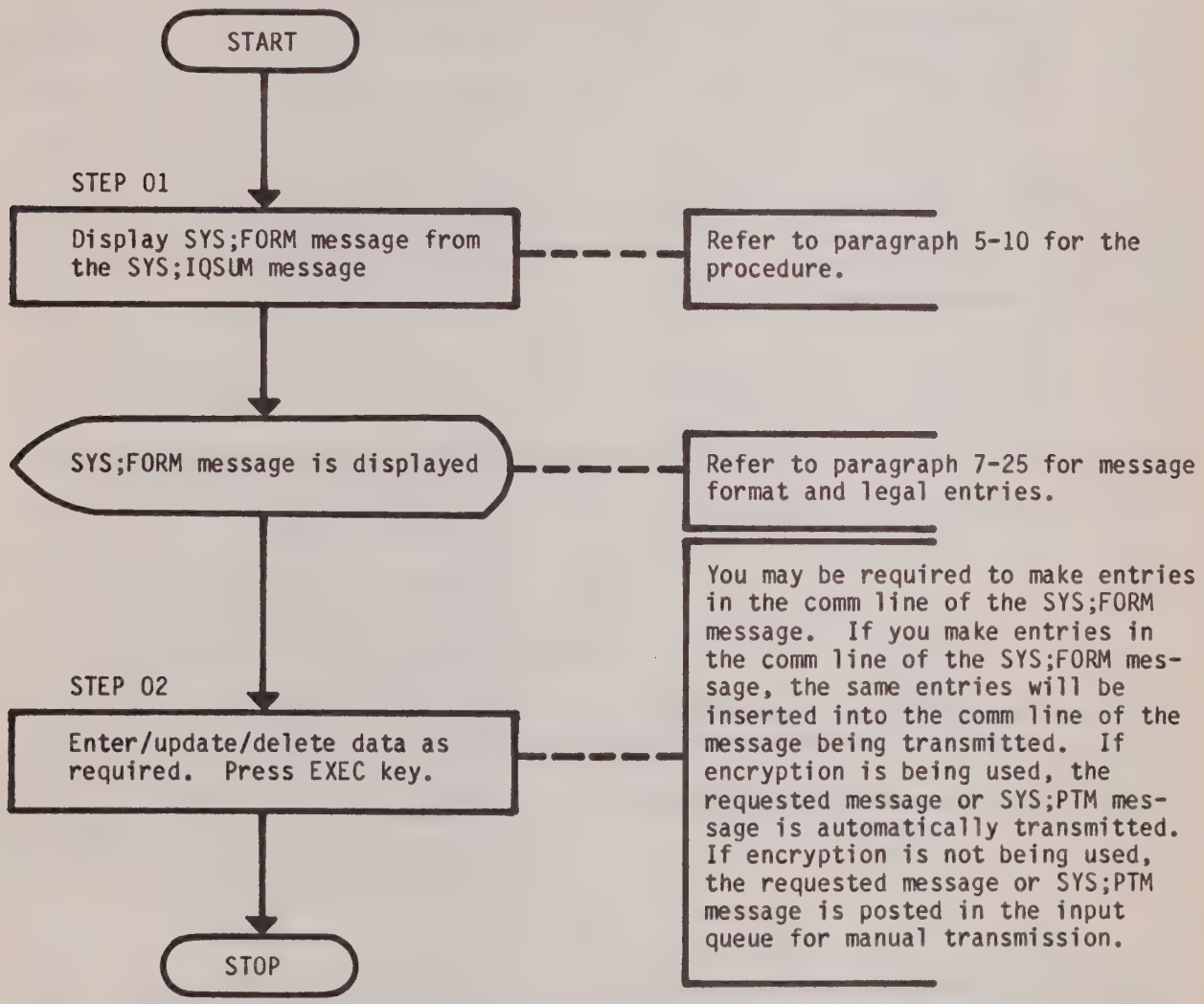
7-14. PROCESSING A REQUEST FOR DATA BASE INFORMATION USING THE HOW;REQUST MESSAGE (HIP) - CONTINUED



7-15. PROCESSING A REQUEST FOR A MESSAGE SKELETON USING THE SYS;FORM MESSAGE

Use this flowchart to perform the following task:

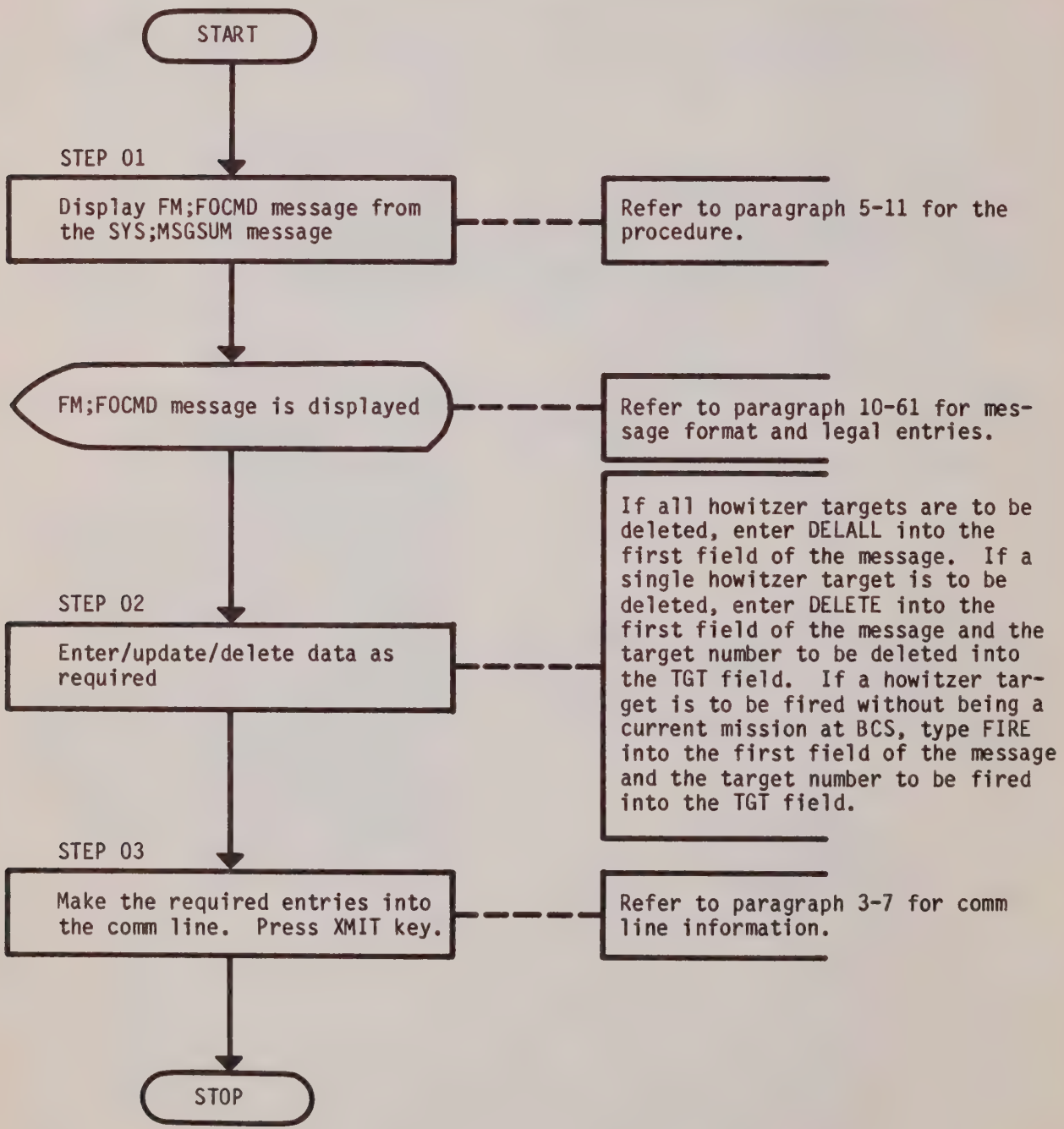
- Process a Request for a Message Skeleton Using the SYS;FORM Message.


START
STEP 01
Display SYS;FORM message from the SYS;IQSUM message
Refer to paragraph 5-10 for the procedure.
SYS;FORM message is displayed
Refer to paragraph 7-25 for message format and legal entries.
STEP 02
Enter/update/delete data as required. Press EXEC key.
You may be required to make entries in the comm line of the SYS;FORM message. If you make entries in the comm line of the SYS;FORM message, the same entries will be inserted into the comm line of the message being transmitted. If encryption is being used, the requested message or SYS;PTM message is automatically transmitted. If encryption is not being used, the requested message or SYS;PTM message is posted in the input queue for manual transmission.
STOP

7-16. PROCESSING HOWITZER TARGET FILE INFORMATION USING THE FM;FOCMD MESSAGE (HIP)

Use this flowchart to perform the following task:

- Process Howitzer Target File Information Using the FM;FOCMD Message (HIP).


START
STEP 01
Display FM;FOCMD message from the SYS;MSGSUM message
Refer to paragraph 5-11 for the procedure.
FM;FOCMD message is displayed
Refer to paragraph 10-61 for message format and legal entries.
STEP 02
Enter/update/delete data as required
If all howitzer targets are to be deleted, enter DELALL into the first field of the message. If a single howitzer target is to be deleted, enter DELETE into the first field of the message and the target number to be deleted into the TGT field. If a howitzer target is to be fired without being a current mission at BCS, type FIRE into the first field of the message and the target number to be fired into the TGT field.
STEP 03
Make the required entries into the comm line. Press XMIT key.
Refer to paragraph 3-7 for comm line information.
STOP

Section III. REQUESTS AND SPECIAL REPORTS MESSAGE FORMATS

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7-17. SYSTEM PLAIN TEXT MESSAGE (SYS;PTM)

a. Purpose. The SYS;PTM message is used to transmit or receive information in plain text. It can be transmitted to any subscriber.

b. Source. The SYS;PTM message is displayed from the following summary messages:

- SYS;MSGSUM
- SYS;IQSUM.

c. Input. You may enter any alphanumeric character into the SYS;PTM message.

d. Computer Processing. The SYS;PTM message cannot be executed. Therefore, no processing takes place.

e. Output. Not applicable.

7-17. SYSTEM PLAIN TEXT MESSAGE (SYS;PTM) - CONTINUED

f. Message Format and Legal Entries. The following SYS;PTM message format is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SYS;PTM:_____Ⅎ_____
--------------------------------------------------------------------
--------------------------------------------------------------------
--------------------------------------------------------------------
--------------------------------------------------------------------
--------------------------------------------------------------------
--------------------------------------------------------------------Ⅎ
```

SYS;PTM:	

SYS;PTM identifies the message as the system plain text message. It is used to transmit and receive plain text information to and from all legal subscribers. Legal entries are up to 424 alphanumeric characters. Legal entries for system plain text messages to be transmitted to an RPV, Firefinder, ATHS, TFDMD, or FIST DMD are up to 37 alphanumeric characters. (The first EOT symbol (Ⅎ) indicates the maximum length for messages transmitted to these devices.) If the system plain text message exceeds 37 characters for these device types, an error message is output. If encoding is required when transmitting to a Firefinder, the first two characters are used for the encode key. You may insert an EOT symbol to shorten the length of the transmission when sending a message to TACFIRE, BCS, VFMED, or a howitzer.

g. Exploded View. Not applicable.

7-18. COORDINATES REPORT MESSAGE (ATI;CDR)

a. Purpose. The ATI;CDR message is used to receive or transmit the characteristics of a target and to define its location by grid coordinates. It can be transmitted to any subscriber device except a DMD.

b. Source. The ATI;CDR message can be displayed from the following summary messages:

- SYS;MSGSUM
- SYS;IQSUM.

c. Input. You enter information describing a target, including grid coordinates, size, and type of target. Refer to appendix K for a matrix which identifies the functions of the ATI;CDR message. The matrix tells you the combinations of fields which must have entries for each function.

d. Computer Processing. The ATI;CDR message cannot be executed at BCS. Therefore, no processing takes place.

e. Output. Not applicable.

f. Message Format and Legal Entries. The following ATI;CDR message format is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
ATI;CDR;TGT:_____;CORD:_____/_______/_____;GZ:___;SPHERE:_;
LATI:_/__/__/__.__;LONGI:_/___/__/__.__;ALT:_____;DTG:__/__/__;
UPDATE:_;DELETE:_;DNA:_;DNC:_;FR:_;RAT:_;MFI:_;
AGCY:_____;RV:___;REL:_;CONF:_;SIZE:____/____;ATT:____;
TYPE:_____/_____;STR:____;PERMNC:____;DOP:_____;
MASKTI:___;CLOTHE:_;VEGTAT:_____;DISPO:____/____;CAS:____;
PT:__________;PTM:_____┘
```

ATI;CDR;	TGT:_____;CORD:_____/_______/_____;GZ:___;SPHERE:_;

ATI;CDR identifies the message as the coordinates report message. This message is for information and transmission only. It is used to display the characteristics of a target and define its location by grid coordinates. This message is not executable and the fields are not used by BCS in processing.

ATI;CDR; | TGT:_____; | CORD:_____/_______/_____;GZ:___;SPHERE:_;

TGT indicates the target number of the target being defined in this report. This is a conditional entry. Legal entries are two letters followed by four numbers.

7-18. COORDINATES REPORT MESSAGE (ATI;CDR) - CONTINUED

ATI;CDR;TGT:_____; **CORD:_____/_____/____;** GZ:___;SPHERE:_;

The CORD field is used to enter UTM grid coordinates of the target location. This is a conditional entry. Legal entries are:

CORD:_____/ _____/____;	Easting in meters	0 to 999999
CORD:_____/ **_____/** ____;	Northing in meters	0 to 11000000
CORD:_____/_____/ **____;**	Altitude in meters	-9999 to +9999

ATI;CDR;TGT:_____;CORD:_____/_____/____; **GZ:___;** SPHERE:_;

GZ indicates the grid zone of the target location coordinates. You enter a plus (+) for Northern Hemisphere and a minus (-) for Southern Hemisphere. Legal entries are -60 to +60 (excluding zero).

ATI;CDR;TGT:_____;CORD:_____/_____/____;GZ:___; **SPHERE:_;**

SPHERE indicates the spheroid code of the target location coordinates. Legal entries are 1 to 8.

LATI:_/__/__/__.__; LONGI:_/___/__/__.__;ALT:_____;DTG:__/__/__;

LATI indicates target latitude. This is a conditional entry. Legal entries are:

LATI:_/ __/__/__.__;	Latitude	+ (north) - (south)
LATI:_/ **__/** __/__.__;	Degree	0 to 84
LATI:_/__/ **__/** __.__;	Minutes	0 to 59
LATI:_/__/__/ **__.__;**	Seconds	0 to 59.99

7-18. COORDINATES REPORT MESSAGE (ATI;CDR) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
ATI;CDR;TGT:_____;CORD:_____/_____/_____;GZ:___;SPHERE:_;
LATI:_/__/__/__.__;LONGI:_/___/__/__.__;ALT:_____;DTG:__/__/__;
UPDATE:_;DELETE:_;DNA:_;DNC:_;FR:_;RAT:_;MFI:_;
AGCY:_____;RV:___;REL:_;CONF:_;SIZE:____/____;ATT:____;
TYPE:_____/_____;STR:____;PERMNC:____;DOP:_____;
MASKTI:___;CLOTHE:_;VEGTAT:_____;DISPO:____/____;CAS:____;
PT:__________;PTM:_____┘
```

LATI:_/__/__/__.__; **LONGI:_/___/__/__.__;** ALT:_____;DTG:__/__/__;

LONGI indicates target longitude. This is a conditional entry. Legal entries are:

LONGI:_/ ___/__/__.__;	Longitude	+ (east) - (west)
LONGI:_/ **___/** __/__.__;	Degrees	0 to 180
LONGI:_/___/ **__/** __.__;	Minutes	0 to 59
LONGI:_/___/__/ **__.__;**	Seconds	0 to 59.99

LONGI:_/__/__/__.__;LONGI:_/___/__/__.__; **ALT:_____;** DTG:__/__/__;

ALT is the altitude of the target in meters. This is a conditional entry. Legal entries are -9999 to +9999.

LATI:_/__/__/__.__;LONGI:_/___/__/__.__;ALT:_____; **DTG:__/__/__;**

DTG indicates the date/time group. An entry in this field specifies the date and time of the target sighting. Legal entries are:

DTG:__/ __/__;	Day	1 to 31
DTG:__/ **__/** __;	Hour	0 to 23
DTG:__/__/ **__;**	Minute	0 to 59

7-18. COORDINATES REPORT MESSAGE (ATI;CDR) - CONTINUED

UPDATE:_; DELETE:_;DNA:_;DNC:_;FR:_;RAT:_;MFI:_;

UPDATE is the update designator. An entry in this field indicates that the information in this report updates an existing TACFIRE data base. This is a conditional entry. Legal entry is an X.

UPDATE:_; **DELETE:_;** DNA:_;DNC:_;FR:_;RAT:_;MFI:_;

DELETE is the delete request indicator. This is a conditional entry. Legal entry is an X.

UPDATE:_;DELETE:_; **DNA:_;** DNC:_;FR:_;RAT:_;MFI:_;

DNA is the do not adjust coordinates indicator. An entry in this field indicates that the target coordinates given will not be altered by the TACFIRE computer. Legal entry is an X.

UPDATE:_;DELETE:_;DNA:_; **DNC:_;** FR:_;RAT:_;MFI:_;

DNC is the do not combine description indicator. An entry in this field indicates that the target being described in this message will not be automatically combined with any other target in the TACFIRE data base. Legal entry is an X.

UPDATE:_;DELETE:_;DNA:_;DNC:_; **FR:_;** RAT:_;MFI:_;

FR is the fire request indicator. An entry in this field causes TACFIRE to generate a request for fire. Legal entry is an X.

UPDATE:_;DELETE:_;DNA:_;DNC:_;FR:_; **RAT:_;** MFI:_;

RAT is the record as target designator. An entry in this field specifies whether this report defines a target or a known point. Legal entries are T (target) or K (known point).

7-18. COORDINATES REPORT MESSAGE (ATI;CDR) - CONTINUED

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
ATI;CDR;TGT:______;CORD:_____/_______/_____;GZ:___;SPHERE:_;
LATI:_/__/__/__.__;LONGI:_/___/__/__.__;ALT:_____;DTG:__/__/__;
UPDATE:_;DELETE:_;DNA:_;DNC:_;FR:_;RAT:_;MFI:_;
AGCY:______;RV:___;REL:_;CONF:_;SIZE:____/____;ATT:____;
TYPE:______/______;STR:____;PERMNC:____;DOP:______;
MASKTI:___;CLOTHE:_;VEGTAT:_____;DISPO:____/____;CAS:____;
PT:___________;PTM:_____________________________┘
```

UPDATE:_;DELETE:_;DNA:_;DNC:_;FR:_;RAT:_; **MFI:_;**

MFI is the mission fired indicator. An entry in this field indicates that this target has been fired on. Legal entry is an X.

AGCY:_____; RV:___;REL:_;CONF:_;SIZE:____/____;ATT:____;

AGCY indicates the originating agency of this report. This is a conditional entry. Legal entries are listed in appendix F.

AGCY:_____; **RV:___;** REL:_;CONF:_;SIZE:____/____;ATT:____;

RV indicates the report value. An entry in this field indicates the accuracy of the reporting agency in meters. This is a conditional entry. Legal entries are 0 to 999.

AGCY:_____;RV:___; **REL:_;** CONF:_;SIZE:____/____;ATT:____;

REL indicates the reliability of the coordinate report. Legal entries are:

E - Excellent
G - Good
F - Fair

AGCY:_____;RV:___;REL:_; **CONF:_;** SIZE:____/____;ATT:____;

CONF is the confirmed target indicator. An entry in this field indicates that this is a confirmed target. Legal entry is an X.

7-18. COORDINATES REPORT MESSAGE (ATI;CDR) - CONTINUED

AGCY:_____;RV:___;REL:_;CONF:_; **SIZE:____/____;** ATT:____;

SIZE indicates the size of the target. A radius or a rectangular area may be defined. If a radius is entered, the width subfield will be blank. Legal entries are:

SIZE:____/ ____;	Radius, width, or length in meters	0 to 9999
SIZE:____/ **____;**	Width or length in meters	0 to 9999

AGCY:_____;RV:___;REL:_;CONF:_;SIZE:____/____; **ATT:____;**

ATT indicates the attitude of the target. An entry in this field specifies the azimuth of the long axis of a rectangular target in mils. This is a conditional entry. Legal entries are 0 to 6399.

TYPE:_____/_____; STR:____;PERMNC:____;DOP:_____;

TYPE specifies the target type and subtype. Legal entries are listed in appendix F.

TYPE:_____/ _____;	Type
TYPE:_____/ **_____;**	Subtype

TYPE:_____/_____; **STR:____;** PERMNC:____;DOP:_____;

STR indicates the target strength. An entry in this field indicates the number of target elements. Legal entries are 0 to 9999.

TYPE:_____/_____;STR:____; **PERMNC:____;** DOP:_____;

An entry in the PERMNC field indicates the length of time in hours that the target will remain at its present location. Legal entries are listed in appendix F.

7-18. COORDINATES REPORT MESSAGE (ATI;CDR) - CONTINUED

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
ATI;CDR;TGT:______;CORD:_____/_______/_____;GZ:___;SPHERE:_;
LATI:_/__/__/__.__;LONGI:_/___/__/__.__;ALT:_____;DTG:__/__/__;
UPDATE:_;DELETE:_;DNA:_;DNC:_;FR:_;RAT:_;MFI:_;
AGCY:______;RV:___;REL:_;CONF:_;SIZE:____/____;ATT:____;
TYPE:______/______;STR:____;PERMNC:____;DOP:______;
MASKTI:___;CLOTHE:_;VEGTAT:_____;DISPO:____/____;CAS:____;
PT:___________;PTM:_____________________________┘
```

TYPE:_____/_____;STR:____;PERMNC:____; **DOP:_____;**

DOP indicates the degree of protection to which personnel would protect themselves during the first and subsequent volleys. Legal entries are listed in appendix F.

MASKTI:___; CLOTHE:_;VEGTAT:_____;DISPO:____/____;CAS:____;

An entry in the MASKTI field indicates, in seconds, the level of enemy training in Nuclear, Biological, and Chemical (NBC) warfare. Legal entries are listed in appendix F.

MASKTI:___; **CLOTHE:_;** VEGTAT:_____;DISPO:____/____;CAS:____;

CLOTHE is the personnel clothing and mask indicator. An entry in this field specifies the type of clothing being worn by personnel in the target area. Legal entries are listed in appendix F.

MASKTI:___;CLOTHE:_; **VEGTAT:_____;** DISPO:____/____;CAS:____;

An entry in the VEGTAT field specifies the type of vegetation at the target location. Legal entries are listed in appendix F.

MASKTI:___;CLOTHE:_;VEGTAT:_____; **DISPO:____/____;** CAS:____;

DISPO indicates the disposition of the target at the end of the mission. Legal entries are listed in appendix F.

7-18. COORDINATES REPORT MESSAGE (ATI;CDR) - CONTINUED

MASKTI:___;CLOTHE:_;VEGTAT:_____;DISPO:____/____; **CAS:____;**

CAS indicates the number of enemy casualties. Legal entries are 0 to 9999.

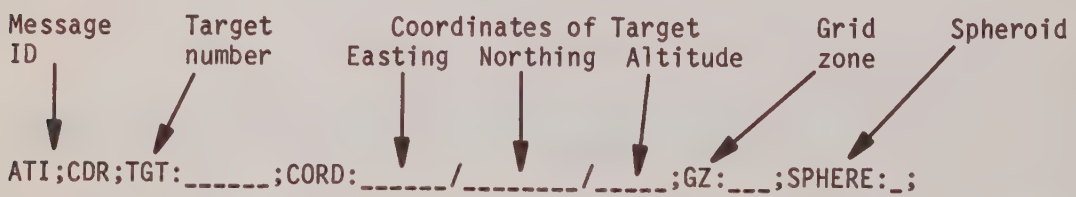
PT:__________; PTM:_____⊣

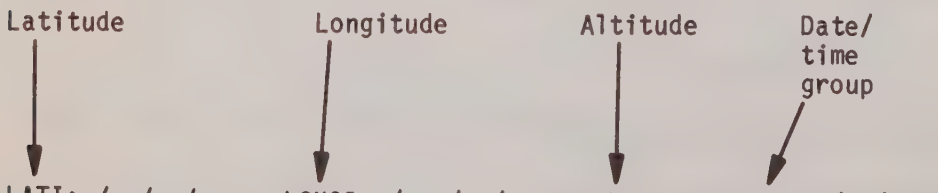
PT is a plain text field used to describe the shell impact. This information is stored by TACFIRE. Legal entries are 1 to 12 alphanumeric characters.

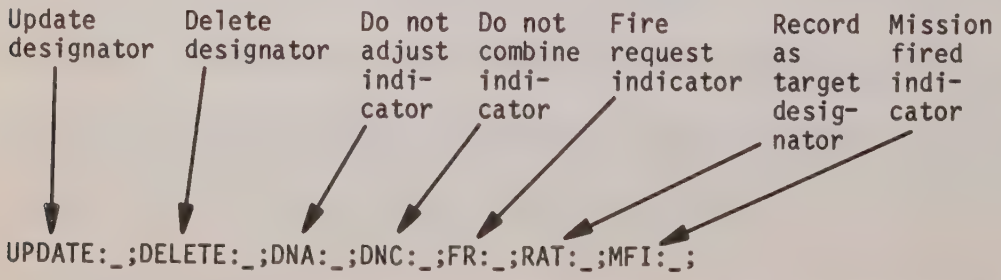
PT:__________; **PTM:_____⊣**

PTM is a plain text message field. A plain text message may be entered to further describe the shell impact. This information is not stored by TACFIRE. Legal entries are 1 to 29 alphanumeric characters.

g. Exploded View. Use the following exploded view as a way to review the message.







7-18. COORDINATES REPORT MESSAGE (ATI;CDR) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
ATI;CDR;TGT:_____;CORD:_____/_____/_____;GZ:___;SPHERE:_;
LATI:_/__/__/__.__;LONGI:_/___/__/__.__;ALT:_____;DTG:__/__/__;
UPDATE:_;DELETE:_;DNA:_;DNC:_;FR:_;RAT:_;MFI:_;
AGCY:_____;RV:___;REL:_;CONF:_;SIZE:____/____;ATT:____;
TYPE:_____/_____;STR:____;PERMNC:____;DOP:_____;
MASKTI:___;CLOTHE:_;VEGTAT:_____;DISPO:____/____;CAS:____;
PT:__________;PTM:_____╛
```

Originating agency → AGCY:_____;
Report value → RV:___;
Reliability indicator → REL:_;
Confirmed target designator → CONF:_;
Target size → SIZE:____/____;
Attitude → ATT:____;

Target type and subtype → TYPE:_____/_____;
Target strength → STR:____;
Target permanence → PERMNC:____;
Degree of protection → DOP:_____;

Level of training indicator → MASKTI:___;
Personnel clothing and mask indicator → CLOTHE:_;
Vegetation type → VEGTAT:_____;
Disposition of target → DISPO:____/____;
Number of enemy casualties → CAS:____;

Plain text → PT:__________;
Plain text message → PTM:_____╛

7-19. AZIMUTH-DISTANCE REPORT MESSAGE (ATI;AZR)

a. Purpose. The ATI;AZR message is used to receive or transmit information about a target and to define its location by means of direction and distance from an observer's location. It can be transmitted to any subscriber device except a DMD.

b. Source. The ATI;AZR message can be displayed from the following summary messages:

- SYS;MSGSUM
- SYS;IQSUM.

c. Input. You enter information defining a target location by means of direction and distance from an observer's location, including observer's coordinates and distance from observer to target. Refer to appendix K for a matrix which identifies the functions of the ATI;AZR message. The matrix tells you the combinations of fields which must have entries for each function.

d. Computer Processing. The ATI;AZR message cannot be executed at BCS. Therefore, no processing takes place.

e. Output. Not applicable.

f. Message Format and Legal Entries. The following ATI;AZR message format is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
ATI;AZR;TGT:_____;OB:__;OBCORD:_____/_____/_____;GZ:___;SPHERE:_;
AZ:____;DIST:____;VERT:_____;ALT:_____;DTG:__/__/__;
UPDATE:_;DELETE:_;DNA:_;DNC:_;SVY:_;RAT:_;MFI:_;
AGCY:_____;RV:___;REL:_;CONF:_;SIZE:____/____;ATT:____;
TYPE:_____/_____;STR:____;PERMNC:____;DOP:_____;
MASKTI:___;CLOTHE:_;VEGTAT:_____;DISPO:____/____;CAS:____;
PT:___________;PTM:_____┘
```

ATI;AZR;	TGT:_____;OB:__;OBCORD:_____/_____/_____;GZ:___;SPHERE:_;

ATI;AZR identifies the message as the azimuth-distance report message. This message is for information and transmission only. It is used to display the characteristics of a target and define its location by means of direction and distance from an observer's location. This message is not executable and the fields are not used by BCS in processing.

7-19. AZIMUTH-DISTANCE REPORT MESSAGE (ATI;AZR) - CONTINUED

ATI;AZR; **TGT:_____;** OB:__;OBCORD:_____/_____/_____;GZ:___;SPHERE:_;

TGT indicates the target number of the target being defined in this report. This is a conditional entry. Legal entries are two letters followed by four numbers.

ATI;AZR;TGT:_____; **OB:__;** OBCORD:_____/_____/_____;GZ:___;SPHERE:_;

OB indicates observer number. Legal entries are 0 to 99.

ATI;AZR;TGT:_____;OB:__; **OBCORD:_____/_____/_____;** GZ:___;SPHERE:_;

OBCORD indicates the observer's location in UTM grid coordinates. This is a conditional entry. Legal entries are:

OBCORD:_____/ _____/_____;	Easting in meters	0 to 999999
OBCORD:_____/ **_____/** _____;	Northing in meters	0 to 11000000
OBCORD:_____/_____/ **_____;**	Altitude in meters	-9999 to +9999

ATI;AZR;TGT:_____;OB:__;OBCORD:_____/_____/_____; **GZ:___;** SPHERE:_;

GZ indicates the grid zone of the observer. You enter a plus (+) for Northern Hemisphere and a minus (-) for Southern Hemisphere. Legal entries are -60 to +60 (excluding zero).

ATI;AZR;TGT:_____;OB:__;OBCORD:_____/_____/_____;GZ:___; **SPHERE:_;**

SPHERE indicates the spheroid code of the observer's location. Legal entries are 1 to 8.

AZ:____; DIST:____;VERT:_____;ALT:_____;DTG:__/__/__;

AZ indicates the grid azimuth of the observer to the target in mils. This is a conditional entry. Legal entries are 0 to 6399.

7-19. AZIMUTH-DISTANCE REPORT MESSAGE (ATI;AZR) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
ATI;AZR;TGT:_____;OB:__;OBCORD:_____/_____/_____;GZ:___;SPHERE:_;
AZ:____;DIST:____;VERT:_____;ALT:_____;DTG:__/__/__;
UPDATE:_;DELETE:_;DNA:_;DNC:_;SVY:_;RAT:_;MFI:_;
AGCY:_____;RV:___;REL:_;CONF:_;SIZE:____/____;ATT:____;
TYPE:_____/_____;STR:____;PERMNC:____;DOP:_____;
MASKTI:__;CLOTHE:_;VEGTAT:_____;DISPO:____/____;CAS:____;
PT:__________;PTM:_____!
```

AZ:____; **DIST:____;** VERT:_____;ALT:_____;DTG:__/__/__;

DIST indicates the distance from the observer to the target in meters. This is a conditional entry. Legal entries are 0 to 9999.

AZ:____;DIST:____; **VERT:_____;** ALT:_____;DTG:__/__/__;

VERT indicates the vertical shift, or the difference in altitude of the observer and the target in meters. If the target is lower, you must enter a minus sign. Legal entries are -9999 to +9999.

AZ:____;DIST:____;VERT:_____; **ALT:_____;** DTG:__/__/__;

ALT is the altitude of the target in meters. Legal entries are -9999 to +9999.

AZ:____;DIST:____;VERT:_____;ALT:_____; **DTG:__/__/__;**

DTG is the date/time group. An entry in this field specifies the date and time of the range report. Legal entries are:

DTG:__/ __/__;	Day	1 to 31
DTG:__/ **__/** __;	Hour	0 to 23
DTG:__/__/ **__;**	Minute	0 to 59

7-19. AZIMUTH-DISTANCE REPORT MESSAGE (ATI;AZR) - CONTINUED

UPDATE:_; DELETE:_;DNA:_;DNC:_;SVY:_;RAT:_;MFI:_;

UPDATE is the update designator. An entry in this field indicates that the information in this report updates an existing TACFIRE data base. This is a conditional entry. Legal entry is an X.

UPDATE:_; **DELETE:_;** DNA:_;DNC:_;SVY:_;RAT:_;MFI:_;

DELETE is the delete request indicator. This is a conditional entry. Legal entry is an X.

UPDATE:_;DELETE:_; **DNA:_;** DNC:_;SVY:_;RAT:_;MFI:_;

DNA is the do not adjust coordinates indicator. An entry in this field indicates that the target coordinates given will not be altered by the TACFIRE computer. Legal entry is an X.

UPDATE:_;DELETE:_;DNA:_; **DNC:_;** SVY:_;RAT:_;MFI:_;

DNC is the do not combine description indicator. An entry in this field indicates that the target being described in this message will not be automatically combined with any other target in the TACFIRE data base. Legal entry is an X.

UPDATE:_;DELETE:_;DNA:_;DNC:_; **SVY:_;** RAT:_;MFI:_;

SVY is the surveyed location indicator. An entry in this field indicates that the observer's location was surveyed. Legal entry is an X.

UPDATE:_;DELETE:_;DNA:_;DNC:_;SVY:_; **RAT:_;** MFI:_;

RAT is the record as target designator. An entry in this field specifies whether this report defines a target or a known point. Legal entries are T (target) or K (known point).

7-19. AZIMUTH-DISTANCE REPORT MESSAGE (ATI;AZR) - CONTINUED

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
ATI;AZR;TGT:______;OB:__;OBCORD:______/_______/_____;GZ:___;SPHERE:_;
AZ:____;DIST:____;VERT:_____;ALT:_____;DTG:__/__/__;
UPDATE:_;DELETE:_;DNA:_;DNC:_;SVY:_;RAT:_;MFI:_;
AGCY:______;RV:___;REL:_;CONF:_;SIZE:____/____;ATT:____;
TYPE:______/______;STR:____;PERMNC:____;DOP:______;
MASKTI:___;CLOTHE:_;VEGTAT:_____;DISPO:____/____;CAS:____;
PT:___________;PTM:____________________________┘
```

UPDATE:_;DELETE:_;DNA:_;DNC:_;SVY:_;RAT:_; **MFI:_;**

MFI is the mission fired indicator. An entry in this field indicates that this target has been fired on. Legal entry is an X.

AGCY:_____; RV:___;REL:_;CONF:_;SIZE:____/____;ATT:____;

AGCY indicates the originating agency of this report. This is a conditional entry. Legal entries are listed in appendix F.

AGCY:_____; **RV:___;** REL:_;CONF:_;SIZE:____/____;ATT:____;

RV indicates the report value. An entry in this field indicates the accuracy of the reporting agency in meters. This is a conditional entry. Legal entries are 0 to 999.

AGCY:_____;RV:___; **REL:_;** CONF:_;SIZE:____/____;ATT:____;

REL indicates the reliability of the azimuth report. Legal entries are:

E - Excellent
G - Good
F - Fair

AGCY:_____;RV:___;REL:_; **CONF:_;** SIZE:____/____;ATT:____;

CONF is the confirmed target indicator. An entry in this field indicates that this is a confirmed target. Legal entry is an X.

7-19. AZIMUTH-DISTANCE REPORT MESSAGE (ATI;AZR) - CONTINUED

AGCY:_____;RV:___;REL:_;CONF:_; **SIZE:____/____;** ATT:____;

SIZE indicates the size of the target. A radius or a rectangular area may be defined. If a radius is entered, the width subfield will be blank. Legal entries are:

SIZE:____/ ____;	Radius, width, or length in meters	0 to 9999
SIZE:____/ **____;**	Width or length in meters	0 to 9999

AGCY:_____;RV:___;REL:_;CONF:_;SIZE:____/____; **ATT:____;**

ATT indicates the attitude of the target. An entry in this field specifies the azimuth of the long axis of a rectangular target in mils. This is a conditional entry. Legal entries are 0 to 6399.

TYPE:_____/_____; STR:____;PERMNC:____;DOP:_____;

TYPE specifies the target type and subtype. Legal entries are listed in appendix F.

TYPE:_____/ _____;	Type
TYPE:_____/ **_____;**	Subtype

TYPE:_____/_____; **STR:____;** PERMNC:____;DOP:_____;

STR indicates the target strength. An entry in this field indicates the number of target elements. Legal entries are 0 to 9999.

TYPE:_____/_____;STR:____; **PERMNC:____;** DOP:_____;

An entry in the PERMNC field indicates the length of time in hours that the target will remain at its present location. Legal entries are listed in appendix F.

7-19. AZIMUTH-DISTANCE REPORT MESSAGE (ATI;AZR) - CONTINUED

```
______;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
ATI;AZR;TGT:______;OB:__;OBCORD:______/_______/_____;GZ:___;SPHERE:_;
AZ:____;DIST:____;VERT:_____;ALT:_____;DTG:__/__/__;
UPDATE:_;DELETE:_;DNA:_;DNC:_;SVY:_;RAT:_;MFI:_;
AGCY:______;RV:___;REL:_;CONF:_;SIZE:____/____;ATT:____;
TYPE:______/______;STR:____;PERMNC:____;DOP:______;
MASKTI:___;CLOTHE:_;VEGTAT:_____;DISPO:____/____;CAS:____;
PT:___________;PTM:____________________________┘
```

TYPE:_____/_____;STR:____;PERMNC:____; **DOP:_____;**

DOP indicates the degree of protection to which personnel would protect themselves during the first and subsequent volleys. Legal entries are listed in appendix F.

MASKTI:___; CLOTHE:_;VEGTAT:_____;DISPO:____/____;CAS:____;

An entry in the MASKTI field indicates, in seconds, the level of enemy training in NBC warfare. Legal entries are listed in appendix F.

MASKTI:___; **CLOTHE:_;** VEGTAT:_____;DISPO:____/____;CAS:____;

CLOTHE is the personnel clothing and mask indicator. An entry in this field specifies the type of clothing being worn by personnel in the target area. Legal entries are listed in appendix F.

MASKTI:___;CLOTHE:_; **VEGTAT:_____;** DISPO:____/____;CAS:____;

An entry in the VEGTAT field specifies the type of vegetation at the target location. Legal entries are listed in appendix F.

MASKTI:___;CLOTHE:_;VEGTAT:_____; **DISPO:____/____;** CAS:____;

DISPO indicates the disposition of the target at the end of the mission. Legal entries are listed in appendix F.

7-19. AZIMUTH-DISTANCE REPORT MESSAGE (ATI;AZR) - CONTINUED

MASKTI:___;CLOTHE:_;VEGTAT:_____;DISPO:____/____; **CAS:____;**

CAS indicates the number of enemy casualties. Legal entries are 0 to 9999.

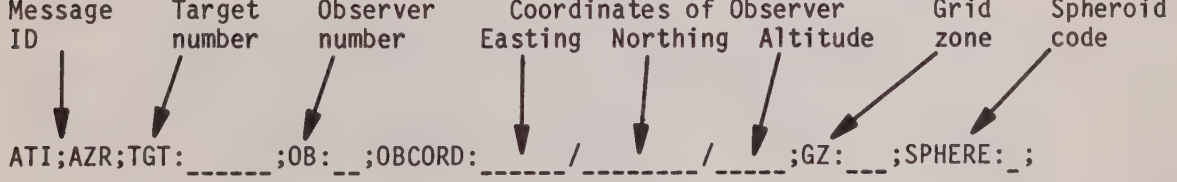
PT:__________; PTM:_____↵

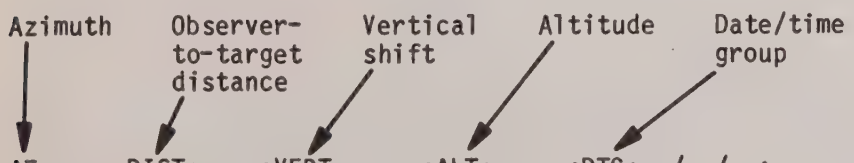
PT is a plain text field used to describe the shell impact. This information is stored by TACFIRE. Legal entries are 1 to 12 alphanumeric characters.

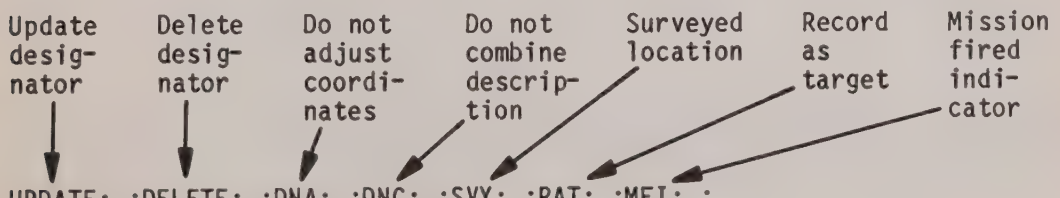
PT:__________; **PTM:_____↵**

PTM is a plain text message field. A plain text message may be entered to further describe the shell impact. This information is not stored by TACFIRE. Legal entries are 1 to 29 alphanumeric characters.

g. Exploded View. Use the following exploded view as a way to review the message.







7-19. AZIMUTH-DISTANCE REPORT MESSAGE (ATI;AZR) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
ATI;AZR;TGT:_____;OB:__;OBCORD:_____/_____/_____;GZ:___;SPHERE:_;
AZ:____;DIST:____;VERT:_____;ALT:_____;DTG:__/__/__;
UPDATE:_;DELETE:_;DNA:_;DNC:_;SVY:_;RAT:_;MFI:_;
AGCY:_____;RV:___;REL:_;CONF:_;SIZE:____/____;ATT:____;
TYPE:_____/_____;STR:____;PERMNC:____;DOP:_____;
MASKTI:___;CLOTHE:_;VEGTAT:_____;DISPO:____/____;CAS:____;
PT:__________;PTM:_____________________________┘
```

Originating agency → AGCY:_____;
Report value → RV:___;
Report reliability → REL:_;
Confirmed target → CONF:_;
Target size → SIZE:____/____;
Target attitude → ATT:____;

Target type and subtype → TYPE:_____/_____;
Target strength → STR:____;
Target permanence → PERMNC:____;
Degree of protection → DOP:_____;

Level of NBC protection training → MASKTI:___;
Personnel clothing and mask indicator → CLOTHE:_;
Vegetation type → VEGTAT:_____;
Target disposition → DISPO:____/____;
Enemy casualties → CAS:____;

Plain text → PT:__________;
Plain text message → PTM:_____________________________┘

7-20. SHELL REPORT MESSAGE (ATI;SHR)

a. Purpose. The ATI;SHR message is used to receive or transmit an indication of enemy shelling activity. It can be transmitted to any subscriber device except a DMD.

b. Source. The ATI;SHR message can be displayed from the following summary messages:

- SYS;MSGSUM
- SYS;IQSUM.

c. Input. You enter data that describes both the crater's location and the shells observed, including caliber and azimuth of the furrow made by the shell. Refer to appendix K for a matrix which identifies the functions of the ATI;SHR message. The matrix tells you the combinations of fields which must have entries for each function.

d. Computer Processing. The ATI;SHR message cannot be executed at BCS. Therefore, no processing takes place.

e. Output. Not applicable.

f. Message Format and Legal Entries. The following ATI;SHR message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
ATI;SHR;TGT:_____;OBCORD:_____/_____/_____;GZ:___;SPHERE:_;
UPDATE:_;DELETE:_;AGCY:_____;RV:___;REL:_;DTG:__/__/__;
TYPE:_____/_____;AZ:____;CALBR:___;XRDS:___;
PT:___________;PTM:_____┘
```

ATI;SHR;	TGT:_____;OBCORD:_____/_____/_____;GZ:___;SPHERE:_;

ATI;SHR identifies the message as the shell report message. This message is for information and transmission only. It provides an indication of enemy shelling activity. This message is not executable and the fields are not used by BCS in processing.

ATI;SHR; | TGT:_____; | OBCORD:_____/_____/_____;GZ:___;SPHERE:_;

TGT indicates the target number of the target being defined in this report. This is a conditional entry. Legal entries are two letters followed by four numbers.

7-20. SHELL REPORT MESSAGE (ATI;SHR) - CONTINUED

ATI;SHR;TGT:_____; **OBCORD:_____/_____/_____;** GZ:___;SPHERE:_;

OBCORD specifies the coordinates of the observer's location. This is a conditional entry. Legal entries are:

OBCORD:_____/ _____/_____;	Easting in meters	0 to 999999
OBCORD:_____/ **_____/** _____;	Northing in meters	0 to 11000000
OBCORD:_____/_____/ **_____;**	Altitude in meters	-9999 to +9999

ATI;SHR;TGT:_____;OBCORD:_____/_____/_____; **GZ:___;** SPHERE:_;

GZ specifies the grid zone of the observer location. You enter a plus (+) for Northern Hemisphere and a minus (-) for Southern Hemisphere. Legal entries are -60 to +60 (excluding zero).

ATI;SHR;TGT:_____;OBCORD:_____/_____/_____;GZ:___; **SPHERE:_;**

SPHERE indicates the spheroid code of the observer location. Legal entries are 1 to 8.

UPDATE:_; DELETE:_;AGCY:_____;RV:___;REL:_;DTG:__/__/__;

UPDATE is the update designator. An entry in this field indicates that the information in this report updates an existing TACFIRE data base. This is a conditional entry. Legal entry is an X.

UPDATE:_; **DELETE:_;** AGCY:_____;RV:___;REL:_;DTG:__/__/__;

DELETE is the delete request indicator. This is a conditional entry. Legal entry is an X.

7-20. SHELL REPORT MESSAGE (ATI;SHR) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
ATI;SHR;TGT:_____;OBCORD:_____/_____/_____;GZ:___;SPHERE:_;
UPDATE:_;DELETE:_;AGCY:_____;RV:___;REL:_;DTG:__/__/__;
TYPE:_____/_____;AZ:____;CALBR:___;XRDS:___;
PT:__________;PTM:_____
```

UPDATE:_;DELETE:_; **AGCY:_____;** RV:___;REL:_;DTG:__/__/__;

AGCY indicates the originating agency of this report. This is a conditional entry. Legal entries are listed in appendix F.

UPDATE:_;DELETE:_;AGCY:_____; **RV:___;** REL:_;DTG:__/__/__;

RV indicates the report value. An entry in this field indicates the accuracy of the reporting agency in meters. This is a conditional entry. Legal entries are 0 to 999.

UPDATE:_;DELETE:_;AGCY:_____;RV:___; **REL:_;** DTG:__/__/__;

REL indicates the reliability of the report. Legal entries are:

E - Excellent
G - Good
F - Fair

UPDATE:_;DELETE:_;AGCY:_____;RV:___;REL:_; **DTG:__/__/__;**

DTG indicates the date/time group. An entry in this field specifies the date and time of the shell report. Legal entries are:

DTG:__/ __/__;	Day	1 to 31
DTG:__/ **__/** __;	Hour	0 to 23
DTG:__/__/ **__;**	Minute	0 to 59

7-20. SHELL REPORT MESSAGE (ATI;SHR) - CONTINUED

TYPE:_____/_____; AZ:____;CALBR:___;XRDS:___;

TYPE indicates weapon type and subtype. This is a conditional entry. Legal entries are listed in appendix F.

TYPE:_____/ _____; Type

TYPE:_____/ **_____;** Subtype

TYPE:_____/_____; **AZ:____;** CALBR:___;XRDS:___;

AZ indicates the azimuth from grid north of shell furrows in mils. This is a conditional entry. Legal entries are 0 to 6399.

TYPE:_____/_____;AZ:____; **CALBR:___;** XRDS:___;

CALBR indicates the estimated caliber of an enemy shell in millimeters. This is a conditional entry. Legal entries are UNK, 60, 81, 82, 107, 120, 160, 240, 280, 45, 57, 70, 75, 76, 85, 88, 100, 105, 122, 130, 152, 155, 175, 180, and 203.

TYPE:_____/_____;AZ:____;CALBR:___; **XRDS:___;**

XRDS represents the number of enemy shells that have impacted. Legal entries are 0 to 999.

PT:_____; PTM:_____↵

PT is a plain text field used to describe the shell impact. This information is stored by TACFIRE. Legal entries are 1 to 12 alphanumeric characters.

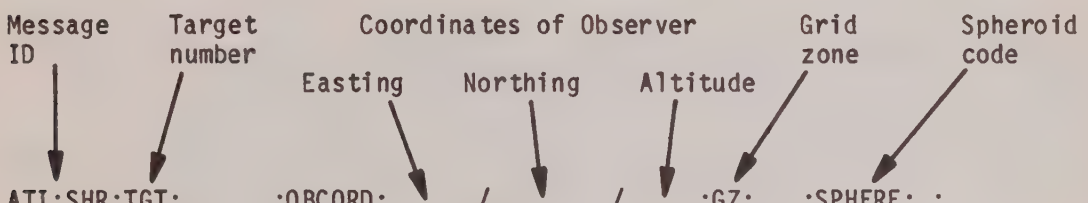
PT:_____; **PTM:_____↵**

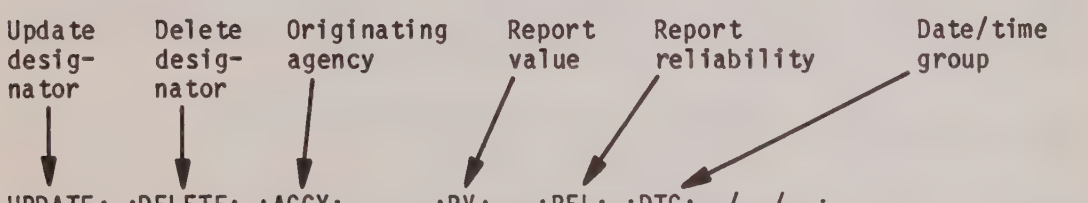
PTM is a plain text message field. A plain text message may be entered to further describe the shell impact. This information is not stored by TACFIRE. Legal entries are 1 to 29 alphanumeric characters.

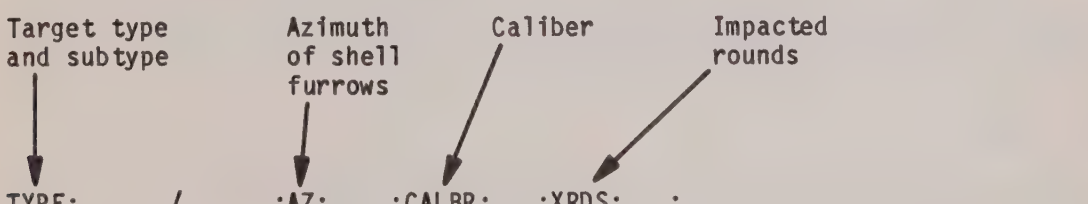
7-20. SHELL REPORT MESSAGE (ATI;SHR) - CONTINUED

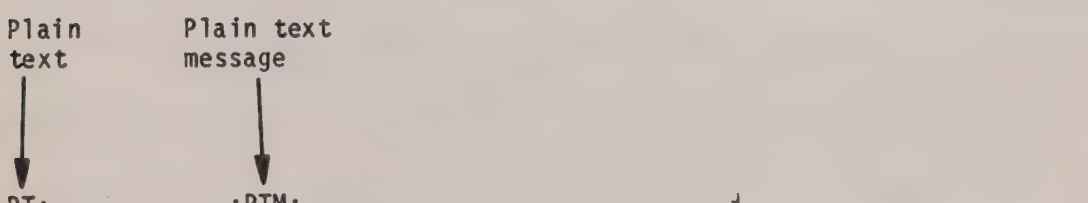
```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
ATI;SHR;TGT:_____;OBCORD:_____/_______/_____;GZ:___;SPHERE:_;
UPDATE:_;DELETE:_;AGCY:_____;RV:___;REL:_;DTG:__/__/__;
TYPE:_____/_____;AZ:____;CALBR:___;XRDS:___;
PT:__________;PTM:_____↵
```

g. Exploded View. Use the following exploded view as a way to review the message.









7-21. SYSTEM RING MESSAGE (SYS;RING) (NON-HIP)

a. Purpose. The SYS;RING message is used at the BCU to request voice communication with a particular howitzer or with all howitzers in the battery. It is also used at the howitzers to request voice communication with the battery.

b. Source. The SYS;RING message can be displayed from the following summary messages:

- SYS;MSGSUM
- SYS;IQSUM.

When the SYS;RING message is displayed from the SYS;MSGSUM message, the actual message format is displayed. When the SYS;RING message is displayed from the SYS;IQSUM message, it is displayed in the form of a SYS;PTM message. The word RINGUN is displayed in the header of the comm line. The howitzer numbers are displayed with an R under the number of the howitzer which sent the message. (When a SYS;RING message is received in the input queue, an alarm will sound, but the MSG RCVD lamp on the BCU will not light. Only the GDU channel lamp will light.)

c. Input. You enter the number of the howitzer (as stored in the BCS;PIECES message) with which you want to establish voice communications. You can enter BTRY if you wish to communicate with all howitzers in the battery.

d. Computer Processing. Pressing the EXEC key (not the XMIT key) causes the message to be transmitted to the indicated howitzer(s).

e. Output. A message requesting voice communication is transmitted to the indicated howitzer(s).

f. Message Format and Legal Entries. The following SYS;RING message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

SYS;RING:____;C:___;

| **SYS;RING:____;** | C:___;

SYS;RING identifies the message as the system ring message. This is a required entry. Legal entries are 1 to 12 (howitzer numbers) or BTRY (battery).

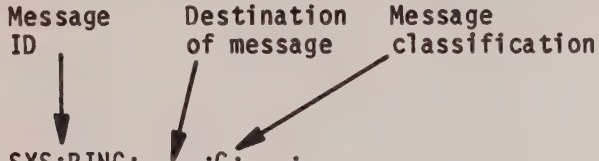
SYS;RING:____; | **C:___;** |

C indicates the classification of message. Legal entries are listed in appendix H.

Default = UN

7-21. SYSTEM RING MESSAGE (SYS;RING) (NON-HIP) - CONTINUED

g. Exploded View. Use the following exploded view as a way to review the message.



7-22. SUPPORT MARK/MOD MESSAGE (SPRT;MRKMOD)

a. Purpose. The SPRT;MRKMOD message is used to receive Mark/MOD data for a nuclear fire mission. The AFU;MV message is stored at TACFIRE, but is not used.

b. Source. The SPRT;MRKMOD message is displayed from the SYS;IQSUM message. It is received from TACFIRE.

c. Input. You make no entries into this message.

d. Computer Processing. The SPRT;MRKMOD message cannot be executed. Therefore, no processing takes place.

e. Output. Not applicable.

f. Message Format and Legal Entries. The following SPRT;MRKMOD message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SPRT;MRKMOD;PLAN:_____;FU:_/_/_/__/___;
FLD1:___/___/__,___/___/__,___/___/__;
FLD2:___/___/__,___/___/__,___/___/__;
FLD3:___/___/__,___/___/__,___/___/__;
LST:_
```

SPRT;MRKMOD; PLAN:_____;FU:_/_/_/__/___;

SPRT;MRKMOD identifies the message as the support Mark/MOD message. This message is queued for operator review and used to display Mark/MOD data for the fire unit.

SPRT;MRKMOD; **PLAN:_____;** FU:_/_/_/__/___;

PLAN indicates the plan name. Legal entries are A through Z, 0 through 9, and the special characters except for the following: /, @, ↵, :, ;, ., and ,.

7-22. SUPPORT MARK/MOD MESSAGE (SPRT;MRKMOD) - CONTINUED

SPRT;MRKMOD;PLAN:_____; | FU:_/_/_/__/___; |

FU indicates the fire unit name. Legal entries are:

| FU:_/ | _/_/__/___;	Section	One alphabetic or numeric character
FU:_/ | _/ | _/__/___;	Platoon	One alphabetic or numeric character
FU:_/_/ | _/ | __/___;	Battery	One alphabetic or numeric character
FU:_/_/_/ | __/ | ___;	Battalion	One or two alphabetic or numeric characters
FU:_/_/_/__/ | ___; |	Regiment	One to three alphabetic or numeric characters

NOTE

The FLD1 line is shown on the next page. The information given also applies to the FLD2 and FLD3 lines.

| FLD1:____/___/__,____/___/__,____/___/__; |

FLD1 through FLD3 indicate Mark/MOD data. Each field has three iterations. Each iteration has three subfields. The entries you make in this field are based on weapon caliber. Legal entries are:

| FLD1:____/ | ___/__,____/___/__,____/___/__;	Mark	MK48, MK33, or MK79
FLD1:____/ | ___/ | __,____/___/__,____/___/__;	MOD	1Y1, 1Y2, 1Y3, 0Y1, 0Y2, 0Y3, or 0Y4
FLD1:____/___/ | __, | ____/___/__,____/___/__;	Quantity	00 to 99

7-22. SUPPORT MARK/MOD MESSAGE (SPRT;MRKMOD) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SPRT;MRKMOD;PLAN:_____;FU:_/_/_/__/___;
FLD1:___/___/__,___/___/__,___/___/__;
FLD2:___/___/__,___/___/__,___/___/__;
FLD3:___/___/__,___/___/__,___/___/__;
LST:_┘
```

LST:_┘

LST is the last message indicator. An entry in this field indicates that this is the last SPRT;MRKMOD message in this series of messages. Legal entry is an X.

---

g. Exploded View. Use the following exploded view as a way to review the message.

Message ID → SPRT;MRKMOD;PLAN:_____;FU:_/_/_/__/___;

Plan name → PLAN:_____

Fire unit → FU:_/_/_/__/___

Mark → FLD1:____/___/__,___/___/__,___/___/__;

MOD → FLD1:____/___/__,___/___/__,___/___/__;

Quantity → FLD1:____/___/__,___/___/__,___/___/__;

```
FLD2:____/___/__,___/___/__,___/___/__;
FLD3:____/___/__,___/___/__,___/___/__;
```

Last message indicator → LST:_┘

7-23. CURRENT MUZZLE VELOCITY MESSAGE (AFU;MV)

a. Purpose. The AFU;MV message is used to transmit muzzle velocity information. It can be transmitted to TACFIRE or other BCS's. The AFU;MV message is stored at TACFIRE, but is not used.

b. Source. The AFU;MV message may be displayed from the following summary messages:

- SYS;MSGSUM
- SYS;IQSUM.

c. Input. Specific muzzle velocities for specified rounds of a fire unit or battery average of muzzle velocity variation by shells are entered into the AFU;MV message.

d. Computer Processing. The AFU;MV message cannot be executed. Therefore, no processing takes place.

e. Output. Not applicable.

f. Message Format and Legal Entries. The following AFU;MV message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;MV;PLAN:_____;FU:_/_/_/__/___;DELETE:_;BKUP:_;DTG:__/__/__;
MV1:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
MV2:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
MV3:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
MV4:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
MV5:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_≠
```

AFU;MV;	PLAN:_____;FU:_/_/_/__/___;DELETE:_;BKUP:_;DTG:__/__/__;

AFU;MV identifies the message as the AFU current muzzle velocity message. This message is operator completed for transmission and is not executable.

AFU;MV; | PLAN:_____; | FU:_/_/_/__/___;DELETE:_;BKUP:_;DTG:__/__/__;

PLAN indicates the plan name. This field is not used by BCS. Legal entries are A through Z, 0 through 9, and the special characters except for the following: /, @, ≠, :, ;, ., and ,.

7-23. CURRENT MUZZLE VELOCITY MESSAGE (AFU;MV) - CONTINUED

AFU;MV;PLAN:_____; **FU:_/_/_/__/___;** DELETE:_;BKUP:_;DTG:__/__/__;

FU specifies the fire unit to which the muzzle velocity data applies. This field is not used by BCS. An entry is required in this field before transmitting the message to TACFIRE. Legal entries or values displayed are:

FU:_/ _/_/__/___;	Section	One alphabetic or numeric character
FU:_/ **_/** _/__/___;	Platoon	One alphabetic or numeric character
FU:_/_/ **_/** __/___;	Battery	One alphabetic or numeric character
FU:_/_/_/ **__/** ___;	Battalion	One or two alphabetic or numeric characters
FU:_/_/_/__/ **___;**	Regiment	One to three alphabetic or numeric characters

AFU;MV;PLAN:_____;FU:_/_/_/__/___; **DELETE:_;** BKUP:_;DTG:__/__/__;

DELETE is the delete indicator. An entry in this field requests that specified muzzle velocities be deleted from the TACFIRE data base. This field is not used by BCS. Legal entry is an X.

AFU;MV;PLAN:_____;FU:_/_/_/__/___;DELETE:_; **BKUP:_;** DTG:__/__/__;

BKUP is the automatic backup transmission indicator. It is a computer generated entry from TACFIRE. An entry in this field directs TACFIRE to store the information in its data base for lateral backup information. This field is not used by BCS. Legal entry is an X.

7-23. CURRENT MUZZLE VELOCITY MESSAGE (AFU;MV) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;MV;PLAN:_____;FU:_/_/_/__/___;DELETE:_;BKUP:_;DTG:__/__/__;
MV1:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
MV2:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
MV3:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
MV4:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
MV5:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
```

AFU;MV;PLAN:_____;FU:_/_/_/__/___;DELETE:_;BKUP:_; **DTG:__/__/__;**

DTG is the date/time group indicator. An entry in this field specifies the date and time of the message. This field is not used by BCS. Legal entries are:

DTG:__/ __/__;	Day	1 to 31
DTG:__/ **__/** __;	Hour	0 to 23
DTG:__/__/ **__;**	Minute	0 to 59

NOTE

The MV1 line is described on the next page. The information given also applies to lines MV2 through MV5.

7-23. CURRENT MUZZLE VELOCITY MESSAGE (AFU;MV) - CONTINUED

```
MV1:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
```

MV1 through MV5 are the muzzle velocity specification fields. Each line has a maximum of four iterations. The first iteration is described below. Entries in these fields specify the muzzle velocity for specified shell, powder lot, and charge number. Your SOP may require the entries to show the battery average muzzle velocity. When completing the MV field, algebraically add the muzzle velocity variation to the standard muzzle velocity to determine the average MV. (See appendix G for legal entries for ammunition.) Legal entries are:

`MV1:___._/` `___/_/_,`	Muzzle velocity in meters per second	0 to 999.9
`MV1:___._/` `___/` `_/_,`	Shell type	Three alphabetic characters
`MV1:___._/___/` `_/` `_,`	Powder lot	One alphabetic character
`MV1:___._/___/_/` `_,`	Charge number	1 to 9

g. Exploded View. Use the following exploded view as a way to review the message.

7-23. CURRENT MUZZLE VELOCITY MESSAGE (AFU;MV) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
AFU;MV;PLAN:_____;FU:_/_/_/__/___;DELETE:_;BKUP:_;DTG:__/__/__;
MV1:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
MV2:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
MV3:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
MV4:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
MV5:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
```

Muzzle velocity — Shell type — Powder lot — Charge number

```
MV1:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
MV2:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
MV3:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
MV4:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
MV5:___._/___/_/_,___._/___/_/_,___._/___/_/_,___._/___/_/_;
```

7-24. NUCLEAR/NONNUCLEAR FIRE PLAN, FIRE PLAN TARGET UPDATE MESSAGE (NNFP;FPTU)

a. Purpose. The NNFP;FPTU message is used for relay only. Therefore, you normally will not see this message. It will be received from a BCS and automatically transmitted to TACFIRE by the TFDMD or FIST DMD without your knowledge. At TACFIRE, the message is used to add or delete targets from an established preliminary target list or to develop a preliminary target list.

b. Source. The NNFP;FPTU message can be displayed from the SYS;IQSUM message only when there is an error in relay.

c. Input. You will make no entries into the NNFP;FPTU message.

d. Computer Processing. The NNFP;FPTU message cannot be executed. Therefore, no processing takes place.

e. Output. Not applicable.

f. Message Format and Legal Entries. The following NNFP;FPTU message is shown as it would appear if you were to see it on the lower display of the BCU. (Remember, however, that under normal conditions, this message will not be displayed.) Each mnemonic used in the message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
NNFP;FPTU;PLAN:_____;CORD:_____/_______/_____;GZ:___;SPHERE:_;
TGTS:_____,_____,_____,_____,_____,_____,_____,_____,_____;
TYPE:_____/_____;DOP:_____;SIZE:____/____;ATT:____;STR:____;RV:___;
SUSP:_;DELETE:_;RAT:_
```

NNFP;FPTU; PLAN:_____;CORD:_____/_______/_____;GZ:___;SPHERE:_;

NNFP;FPTU identifies the message as the nuclear/nonnuclear fire plan, fire plan target update message.

NNFP;FPTU; **PLAN:_____;** CORD:_____/_______/_____;GZ:___;SPHERE:_;

PLAN specifies the fire plan name. Values displayed are A through Z, 0 through 9, and the special characters except for the following: /, @, ±, :, ;, ., and ,.

7-24. NUCLEAR/NONNUCLEAR FIRE PLAN, FIRE PLAN TARGET UPDATE MESSAGE (NNFP;FPTU) - CONTINUED

NNFP;FPTU;PLAN:_____; | CORD:_____/_____/_____; | GZ:___;SPHERE:_;

CORD indicates the UTM grid coordinates and altitude of the target being defined. This is a conditional entry. Values displayed are:

| CORD:_____/ | _____/_____;	Easting in meters	0 to 999999
CORD:_____/ | _____/ | _____;	Northing in meters	0 to 11000000
CORD:_____/_____/ | _____; |	Altitude in meters	-9999 to +9999

NNFP;FPTU;PLAN:_____;CORD:_____/_____/_____; | GZ:___; | SPHERE:_;

GZ indicates the grid zone of the target coordinates. Values displayed are -60 to +60 (excluding zero).

NNFP;FPTU;PLAN:_____;CORD:_____/_____/_____;GZ:___; | SPHERE:_; |

SPHERE indicates the spheroid of the target coordinates. Values displayed are 1 to 8.

| TGTS:_____, | _____,_____,_____,_____,_____,_____,_____,_____;

TGTS specifies the target number(s) of the target or targets being added or deleted. A maximum of nine target numbers may be displayed. This is a conditional entry. Values displayed are two letters followed by four numbers in each subfield.

7-24. NUCLEAR/NONNUCLEAR FIRE PLAN, FIRE PLAN TARGET UPDATE MESSAGE (NNFP;FPTU) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
NNFP;FPTU;PLAN:_____;CORD:_____/_____/_____;GZ:___;SPHERE:_;
TGTS:_____,_____,_____,_____,_____,_____,_____,_____,_____;
TYPE:_____/_____;DOP:_____;SIZE:____/____;ATT:____;STR:____;RV:___;
SUSP:_;DELETE:_;RAT:_
```

TYPE:_____/_____; DOP:_____;SIZE:____/____;ATT:____;STR:____;RV:___;

TYPE indicates the target type and subtype. An entry in this field specifies the target type of the new target or updates the type of an existing target. Values displayed are listed in appendix F.

TYPE:_____/ _____;	Type
TYPE:_____/ _____;	Subtype

TYPE:_____/_____; DOP:_____; SIZE:____/____;ATT:____;STR:____;RV:___;

DOP indicates the degree of protection to which personnel would protect themselves during first and subsequent volleys. Values displayed are listed in appendix F.

TYPE:_____/_____;DOP:_____; SIZE:____/____; ATT:____;STR:____;RV:___;

SIZE indicates the target size. If the target is circular, the radius can be entered, and the width subfield will be blank. If the target is rectangular, both length and width will be specified, and there will be an entry in the ATT field. Values displayed are:

SIZE:____/ ____;	Radius, width, or length in meters	0 to 9999
SIZE:____/ ____;	Width or length in meters	0 to 9999

7-24. NUCLEAR/NONNUCLEAR FIRE PLAN, FIRE PLAN TARGET UPDATE MESSAGE (NNFP;FPTU) - CONTINUED

TYPE:_____/_____;DOP:_____;SIZE:____/____; **ATT:____;** STR:____;RV:___;

ATT indicates the attitude of the target. An entry in this field specifies the azimuth of the long axis of a rectangular target in mils. There will be an entry in this field if there are entries in both subfields of SIZE. Values displayed are 0 to 6399.

TYPE:_____/_____;DOP:_____;SIZE:____/____;ATT:____; **STR:____;** RV:___;

STR indicates strength of target or number of target elements. Values displayed are 0 to 9999.

TYPE:_____/_____;DOP:_____;SIZE:____/____;ATT:____;STR:____; **RV:___;**

RV is the report value indicator. An entry in this field indicates the accuracy of the reporting agency in meters. Values displayed are 0 to 999.

SUSP:_; DELETE:_;RAT:_↵

An entry in the SUSP field indicates that this target is suspect. Value displayed is an X.

SUSP:_; **DELETE:_;** RAT:_↵

DELETE is the delete request indicator. An entry in this field deletes specified data from the TACFIRE file. Value displayed is an X.

SUSP:_;DELETE:_; **RAT:_↵**

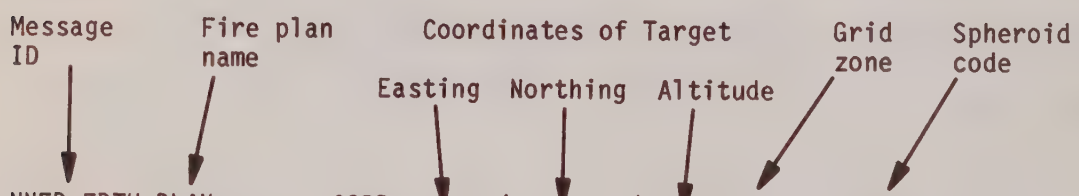
RAT is the record as target indicator. An entry in this field indicates that the data is to be stored in the ATI target file of TACFIRE as a current target/known point or a fire plan target. Values displayed are T or K.

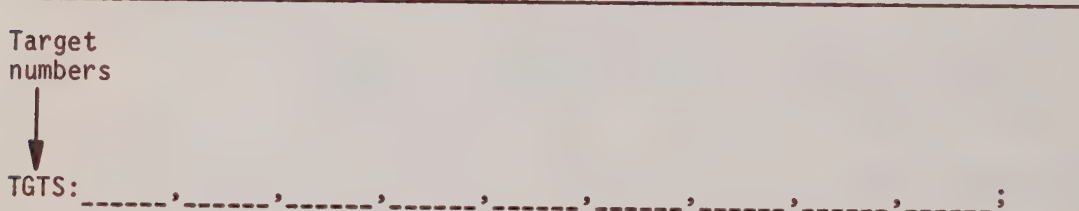
7-24. NUCLEAR/NONNUCLEAR FIRE PLAN, FIRE PLAN TARGET UPDATE MESSAGE (NNFP;FPTU) - CONTINUED

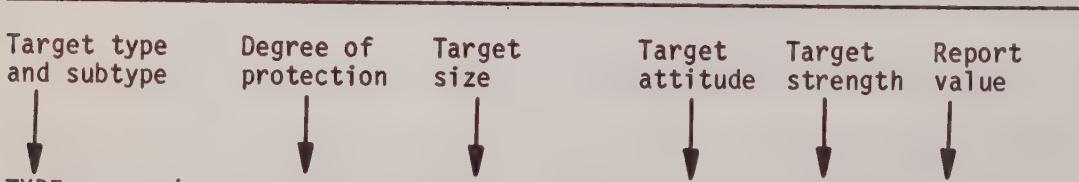
```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
NNFP;FPTU;PLAN:_____;CORD:_____/_______/_____;GZ:___;SPHERE:_;
TGTS:_____,_____,_____,_____,_____,_____,_____,_____,_____;
TYPE:_____/_____;DOP:_____;SIZE:____/____;ATT:____;STR:____;RV:___;
SUSP:_;DELETE:_;RAT:_┘
```

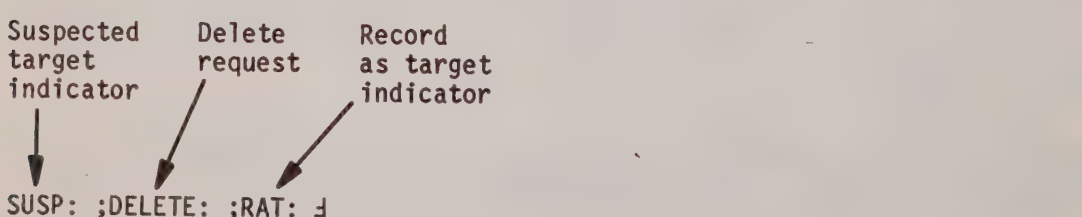
---

g. Exploded View. Use the following exploded view as a way to review the message.









7-25. SYSTEM MESSAGE FORMAT REQUEST MESSAGE (SYS;FORM)

a. Purpose. The SYS;FORM message is used for transmission only by the VFMED to request blank message skeleton formats from BCS. Refer to paragraph 7-8 for a list of message skeletons that may be requested.

b. Source. The SYS;FORM message is received from a VFMED and automatically processed if encryption is being used or the AUTH field of the SYS;SETUP message has an entry. If manual authentication is used, the SYS;FORM message must be displayed from the input queue. When manual authentication is required, make entries in the comm line of the SYS;FORM message prior to execution. After authentication is complete, press the EXEC key.

c. Input. You will make no entries into the SYS;FORM message unless manual authentication is required.

d. Computer Processing. When the SYS;FORM message is executed, BCS will automatically retrieve the requested message skeleton or a SYS;PTM message stating an illegal message type is being requested.

e. Output. If encryption is being used, the requested message or SYS;PTM message is automatically transmitted to the subscriber requesting the message. If encryption is not being used, the requested message or SYS;PTM message is posted in the input queue for manual transmission.

f. Message Format and Legal Entries. The following SYS;FORM message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SYS;FORM:__/____
```

SYS;FORM:__/____

SYS;FORM identifies the message as the system message format request message. Legal entries are:

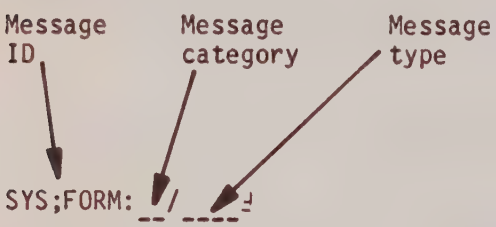
SYS;FORM:__/ ____	First two characters of message category	Two alphabetic characters
SYS;FORM:__/ ____	First four characters of message type	Four alphabetic characters

---

7-25. SYSTEM MESSAGE FORMAT REQUEST MESSAGE (SYS;FORM) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
SYS;FORM:__/____
```

g. Exploded View. Use the following exploded view as a way to review the message.



7-26. MOVEMENT ORDERS MESSAGE (HOW;MOVE) (HIP)

a. Purpose. The HOW;MOVE message is transmitted from the platoon BCS to the howitzer to control or direct movement to a firing area, firing point, initialization point, or resupply point. It is also used to direct the howitzer to remain at its present position or to report its location to BCS.

b. Source. The HOW;MOVE message may be displayed from the following messages:

- SYS;IQSUM
- SYS;MSGSUM.

c. Input. Specific coordinates to control or direct movement of howitzers are entered into the HOW;MOVE message. Refer to appendix K for a matrix which identifies the functions of the HOW;MOVE message. The matrix tells you the combinations of fields which must have entries for each function.

d. Computer Processing. When the EXEC key is pressed, the CORD field is expanded to long coordinates if short coordinates were entered. If the GZ field was left blank, it is completed with the map mod grid zone. The SB field is completed and the message is transmitted to the appropriate howitzer.

e. Output. The HOW;MOVE message is automatically transmitted to the appropriate howitzers.

f. Message Formats and Legal Entries. The following HOW;MOVE message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;MOVE;FU:_/_/_/__/___;CORD:_____/_____/____;GZ:___;RADIUS:___;
STAY:_;REPORT:_;FIREAR:_;INITAL:_;LOG:_;DTG:__/__/__;
LSECT:____;CSECT:____;RSECT:____
```

HOW;MOVE;	FU:_/_/_/__/___;CORD:_____/_____/_____;GZ:___;RADIUS:___;

HOW;MOVE identifies the message as the howitzer movement orders message.

7-26. MOVEMENT ORDERS MESSAGE (HOW;MOVE) (HIP) - CONTINUED

HOW;MOVE; **FU:_/_/_/__/___;** CORD:_____/_____/_____;GZ:___;RADIUS:___;

FU indicates the logical name of the howitzer. This is a required entry. Legal entries are:

FU:_/ _/_/__/___;	Section	1 to 4
FU:_/ **_/** _/__/___;	Platoon	1 to 2
FU:_/_/ **_/** __/___;	Battery	A to Z
FU:_/_/_/ **__/** ___;	Battalion	1 to 99
FU:_/_/_/__/ **___;**	Regiment	1 to 999

HOW;MOVE;FU:_/_/_/__/___; **CORD:_____/_____/_____;** GZ:___;RADIUS:___;

CORD indicates the coordinates in UTM grid coordinates. This is a conditional entry. Make an entry in this field if you made an entry in FIREAR, INITIAL, or LOG. Legal entries are:

CORD:_____/ _____/_____;	Easting in meters	0 to 999999
CORD:_____/ **_____/** _____;	Northing in meters	0 to 11000000
CORD:_____/_____/ **_____;**	Altitude in meters	-9999 to +9999

HOW;MOVE;FU:_/_/_/__/___;CORD:_____/_____/_____; **GZ:___;** RADIUS:___;

GZ indicates the grid zone of the grid coordinates. This is an optional entry. You enter a plus (+) for Northern Hemisphere and a minus (-) for Southern Hemisphere. Legal entries are -60 to +60 (excluding zero).

7-26. MOVEMENT ORDERS MESSAGE (HOW;MOVE) (HIP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;MOVE;FU:_/_/_/__/___;CORD:_____/_____/____;GZ:___;RADIUS:___;
STAY:_;REPORT:_;FIREAR:_;INITAL:_;LOG:_;DTG:__/__/__;
LSECT:____;CSECT:____;RSECT:____
```

HOW;MOVE;FU:_/_/_/__/___;CORD:_____/_____/____;GZ:___; **RADIUS:___;**

RADIUS indicates the radius of the firing area in meters. This is a conditional entry. Make an entry in this field if you made an entry in FIREAR. Legal entries are 0 to 500.

STAY:_; REPORT:_;FIREAR:_;INITAL:_;LOG:_;DTG:__/__/__;

STAY indicates that the howitzer is to remain where it is. This is a conditional entry. Make no entry in this field if there is an entry in FIREAR, INITIAL, or LOG. Legal entry is an X.

STAY:_; **REPORT:_;** FIREAR:_;INITAL:_;LOG:_;DTG:__/__/__;

REPORT indicates that the howitzer is to report his location and mask data. This is a conditional entry. Legal entry is an X.

STAY:_;REPORT:_; **FIREAR:_;** INITAL:_;LOG:_;DTG:__/__/__;

FIREAR indicates that the entry in CORD is the grid coordinates of the center of the firing area. This is a conditional entry. Make an entry in this field if there is an entry in RADIUS and you have not made an entry in INITIAL or LOG. Legal entry is an X.

STAY:_;REPORT:_;FIREAR:_; **INITAL:_;** LOG:_;DTG:__/__/__;

INITIAL indicates that the entry in CORD is the grid coordinates of the initialization point. This is a conditional entry. Make an entry in this field only if you have not made an entry in FIREAR or LOG. Legal entry is an X.

7-26. MOVEMENT ORDERS MESSAGE (HOW;MOVE) (HIP) - CONTINUED

STAY:_;REPORT:_;FIREAR:_;INITAL:_; **LOG:_;** DTG:__/__/__;

LOG indicates that the entry in CORD is the grid coordinates of the logistics resupply point. This is a conditional entry. Make an entry in this field only if you have not made an entry in FIREAR or INITIAL. Legal entry is an X.

STAY:_;REPORT:_;FIREAR:_;INITAL:_;LOG:_; **DTG:__/__/__;**

DTG indicates the day and time to initiate the move. This is a conditional entry. If you make an entry in one subfield, you must make an entry in all subfields. Legal entries are:

DTG:__/ __/__;	Day	1 to 31
DTG:__/ **__/** __;	Hour	0 to 23
DTG:__/__/ **__;**	Minute	0 to 59

LSECT:____; CSECT:____;RSECT:____↵

LSECT indicates the left edge of the sector of orientation. This is an optional entry. Legal entries are 0 to 6399.

LSECT:____; **CSECT:____;** RSECT:____↵

CSECT indicates the center of the sector of orientation. This is a conditional entry. You must make an entry in this field if there is an entry in FIREAR. Legal entries are 0 to 6399.

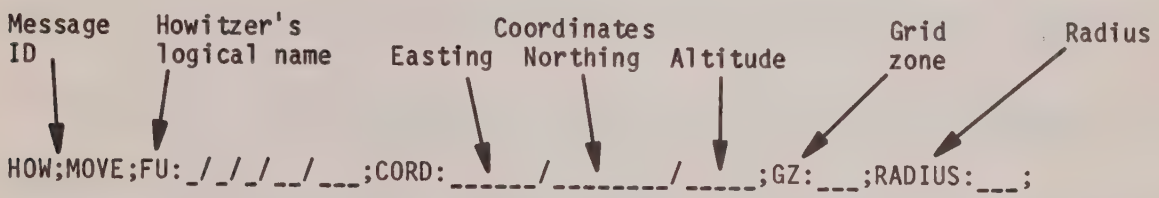
LSECT:____;CSECT:____; **RSECT:____↵**

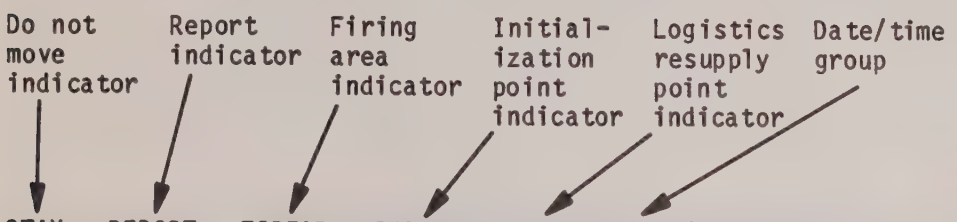
RSECT indicates the right edge of the sector of orientation. This is an optional entry. Legal entries are 0 to 6399.

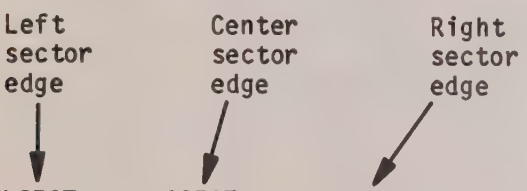
7-26. MOVEMENT ORDERS MESSAGE (HOW;MOVE) (HIP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;MOVE;FU:_/_/_/__/___;CORD:_____/_______/_____;GZ:___;RADIUS:___;
STAY:_;REPORT:_;FIREAR:_;INITAL:_;LOG:_;DTG:__/__/__;
LSECT:____;CSECT:____;RSECT:____
```

g. Exploded View. Use the following exploded view as a way to review the message.







7-27. REQUEST FOR DATA MESSAGE (HOW;REQUST) (HIP)

a. Purpose. The HOW;REQUST message is used to request missing data base information from BCS or the howitzers.

b. Source. The HOW;REQUST message may be selected from the following summary messages:

- SYS;MSGSUM
- SYS;IQSUM.

c. Input. Specific messages or target numbers are requested by entering them into the HOW;REQUST message.

d. Computer Processing. Upon execution of the HOW;REQUST message, the BCS or howitzer will automatically generate the requested message.

e. Output. When the HOW;REQUST message is received and executed at BCS, the requested message will either be displayed for manual transmission, transmitted automatically, or posted in the input queue without being displayed, as in the case of the HOW;MOVE message. If the ATHDB field of the SYS;SETUP message has an entry of X and a HOW;REQUST is executed that generates more messages than can be placed in the transmit queue, the remaining messages are placed in the input queue with an error attached. In some cases, a blank format is generated for the operator to complete.

f. Message Format and Legal Entries. The following HOW;REQUST message is shown as it appears on the lower display of the BCU. Each mnemonic used in the message is explained and the legal entries are provided.

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;REQUST;FU:_/_/_/__/___;FORM:__________;TGTREQ:_____↵
```

HOW;REQUST;	FU:_/_/_/__/___;FORM:__________;TGTREQ:_____↵

HOW;REQUST identifies the message as the howitzer request for data message.

7-27. REQUEST FOR DATA MESSAGE (HOW;REQUST) (HIP) - CONTINUED

HOW;REQUST; **FU:_/_/_/__/___;** FORM:_____;TGTREQ:_____↵

FU indicates the howitzer's logical name. This is a required entry. Legal entries are:

FU:_/ _/_/__/___;	Section	1 to 4, blank
FU:_/ **_/** _/__/___;	Platoon	1 or 2, blank
FU:_/_/ **_/** __/___;	Battery	A to Z
FU:_/_/_/ **__/** ___;	Battalion	1 to 99
FU:_/_/_/__/ **___;**	Regiment	1 to 999

HOW;REQUST;FU:_/_/_/__/___; **FORM:_____;** TGTREQ:_____↵

FORM identifies the message being requested by giving the message category and type. This is a conditional entry. You must make an entry in either FORM or TGTREQ, but not both. Legal entries are:

AFU MASK
AFU REG
ALL TGTS (for transmission only)
BCS MVV
HOW AMOUP
HOW MOVE
HOW SBT
HOW UPDATE
INIT
MET CM
SPRT MAP

7-27. REQUEST FOR DATA MESSAGE (HOW;REQUST) (HIP) - CONTINUED

```
_____;P:_;SB:_/_/_/__/___;C:___;SG:__,__;DT:__,__/__/__;ID:____;A:_;___
HOW;REQUST;FU:_/_/_/__/___;FORM:_________;TGTREQ:_____┘
```

```
HOW;REQUST;FU:_/_/_/__/___;FORM:_________; | TGTREQ:_____┘ |
```

TGTREQ indicates a specific target number to be the subject of the message. Legal entries are two letters followed by four numbers if the message is transmitted to a howitzer. This is a conditional entry. You must make an entry in either FORM or TGTREQ, but not both.

---

g. Exploded View. Use the following exploded view as a way to review the message.

CHAPTER 8

DIAGNOSTIC TESTS

OVERVIEW

This chapter describes diagnostic tests. Troubleshooting and maintenance procedures are not included. Refer to TM 11-7440-283-12-1 or TM 11-5815-602-12 if any of these tests are not completed satisfactorily.

Section I provides a general description of the diagnostic tests.

Section II provides a flowchart which shows how you perform diagnostic tests.

Section III provides specific information about the SYS;TESTS message format. The message format is shown as it appears on the lower display of the BCU. An explanation of the mnemonics used and the legal entries is provided.

Section IV provides an explanation of the test pages used during the conduct of diagnostic tests.

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Section II.	DIAGNOSTIC TESTS FLOWCHART	8-3
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Section I. GENERAL INFORMATION

SECTION CONTENTS

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SYSTEM-GENERATED DIAGNOSTIC TESTS	8-1	8-1
OPERATOR-GENERATED DIAGNOSTIC TESTS	8-2	8-2

8-1. SYSTEM-GENERATED DIAGNOSTIC TESTS

Computers work very rapidly, usually with programs and data that cannot be directly monitored by the operator. To ensure that hardware and software faults are detected and corrected as quickly as possible, a number of computer-generated diagnostic tests are built into the BCS. These diagnostic tests will be run automatically whenever the computer is not busy. As long as no faults are detected, you will not know that the diagnostic tests are being run. If a fault is detected, the BCS will warn you in one of the following ways, depending upon the type of fault detected:

8-1. SYSTEM-GENERATED DIAGNOSTIC TESTS - CONTINUED

- BCS stops processing.
- PLU LOAD lamp does not go off when you press the LOAD PLU button during startup procedures.
- One or more of the BIT STATUS lamps on the front panel of the BCU light.

If any of the above fault indicators occur, notify your supervisor. Refer to TM 11-7440-283-12-1 or TM 11-5815-602-12 for procedures to follow to correct the fault.

8-2. OPERATOR-GENERATED DIAGNOSTIC TESTS

a. There are a number of diagnostic tests that you may initiate to ensure that the system is functioning properly. The SYS;TESTS message will be displayed upon initial load of the system before the SYS;WEAPONS message is displayed. The SELECT field of the SYS;TESTS message will be displayed with a 7 (EXIT DIAGNOSTICS). If you do not wish to perform diagnostic tests, press the EXEC key and the SYS;WEAPONS message will be displayed. If you wish to perform diagnostic tests, select one of the options from the SYS;TESTS message depending on the specific component of the system that you desire to test. You may select from the following test options:

- DISPLAY TEST
- KEYBOARD TEST
- PRINTER TEST
- COMMUNICATION CHANNELS TEST
- GDU CHANNEL TEST
- FRONT PANEL TEST
- EXIT DIAGNOSTICS
- RUN 1-7

If you select RUN 1-7, each individual test will be run one after the other. Section II of this chapter contains detailed instructions explaining how each of these tests is selected and processed.

b. Your SOP will tell you when to perform these diagnostic tests. Whenever you suspect that one or more components of the system are not functioning properly, you should select the appropriate diagnostic test from the SYS;TESTS message. Conduct the test according to the procedures outlined in section II of this chapter.

c. If you want to terminate the test procedure, enter 7 into the SELECT field of the SYS;TESTS message and press the EXEC key. The computer will exit from the diagnostic test function and display the SYS;WEAPONS message. Once diagnostic tests are exited, they cannot be reentered without shutting down and reloading the system.

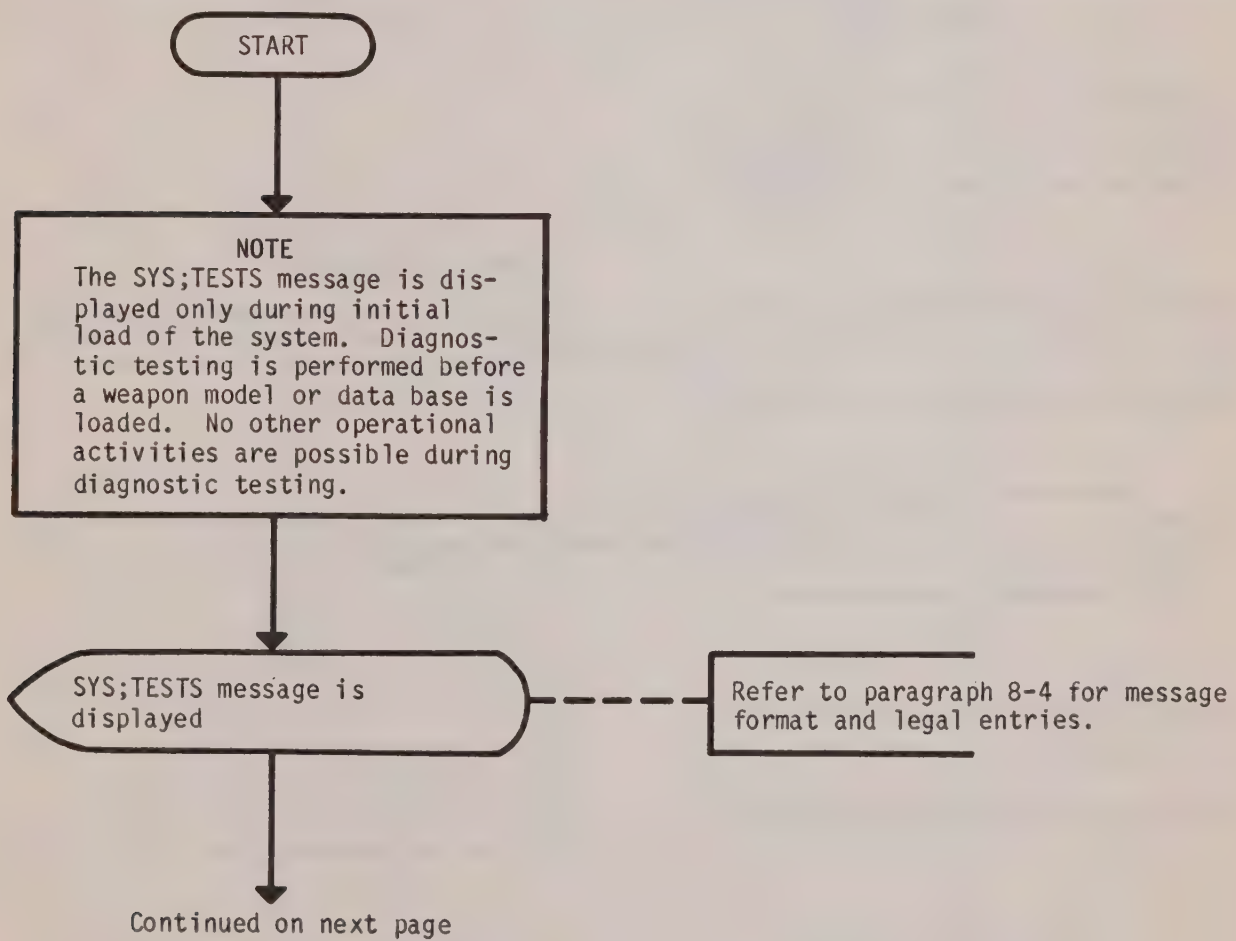
Section II. DIAGNOSTIC TESTS FLOWCHART

SECTION CONTENTS	PARA	PAGE
PERFORMING DIAGNOSTIC TESTS	8-3	8-3

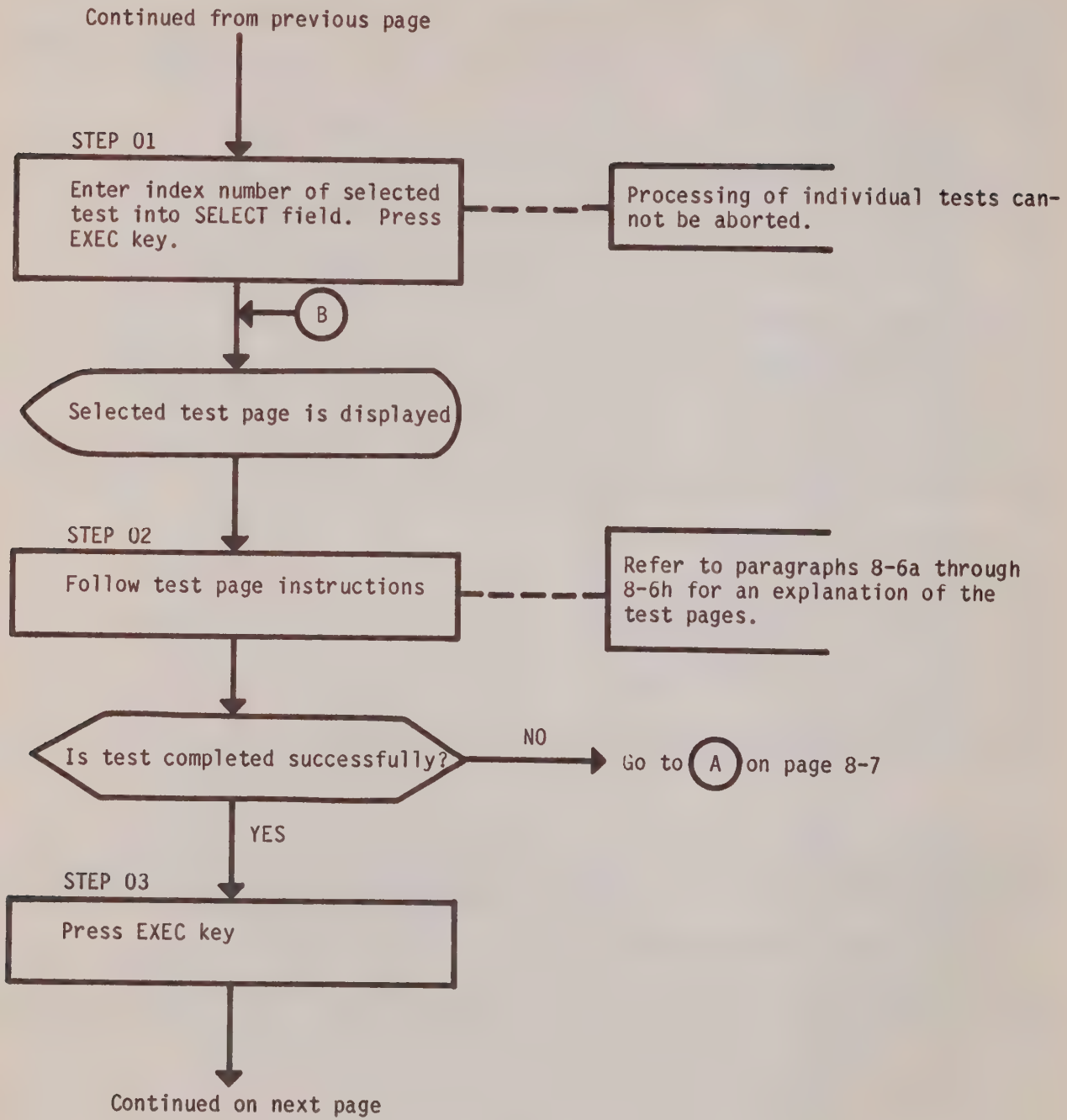
8-3. PERFORMING DIAGNOSTIC TESTS

Follow the steps in this flowchart to perform the following task:

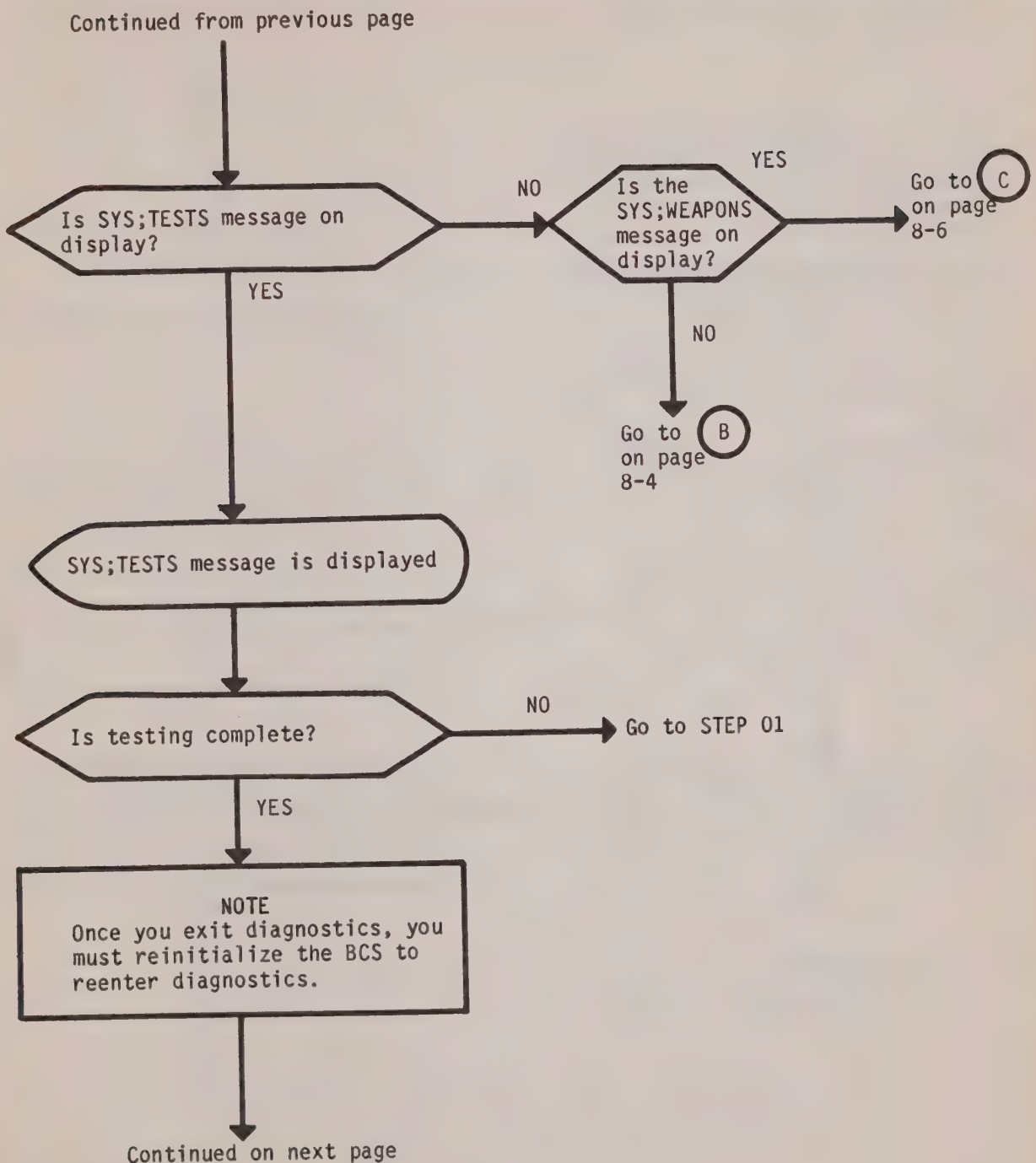
- Perform Diagnostic Tests Using the SYS;TESTS message.


START
NOTE
The SYS;TESTS message is displayed only during initial load of the system. Diagnostic testing is performed before a weapon model or data base is loaded. No other operational activities are possible during diagnostic testing.
SYS;TESTS message is displayed
Refer to paragraph 8-4 for message format and legal entries.
Continued on next page

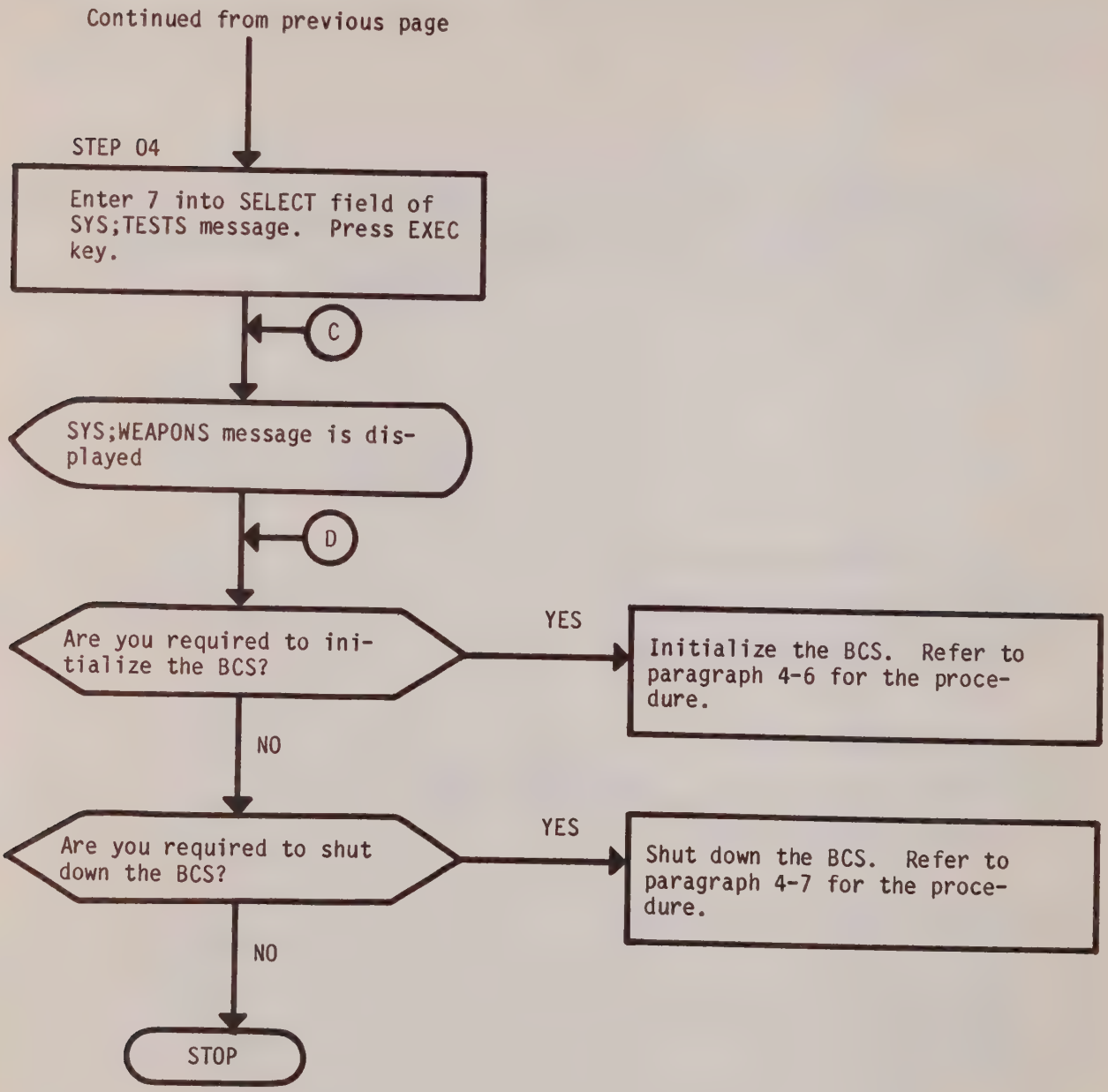
8-3. PERFORMING DIAGNOSTIC TESTS - CONTINUED


Continued from previous page
STEP 01
Enter index number of selected test into SELECT field. Press EXEC key.
Processing of individual tests cannot be aborted.
B
Selected test page is displayed
STEP 02
Follow test page instructions
Refer to paragraphs 8-6a through 8-6h for an explanation of the test pages.
Is test completed successfully?
NO
Go to A on page 8-7
YES
STEP 03
Press EXEC key
Continued on next page

8-3. PERFORMING DIAGNOSTIC TESTS - CONTINUED

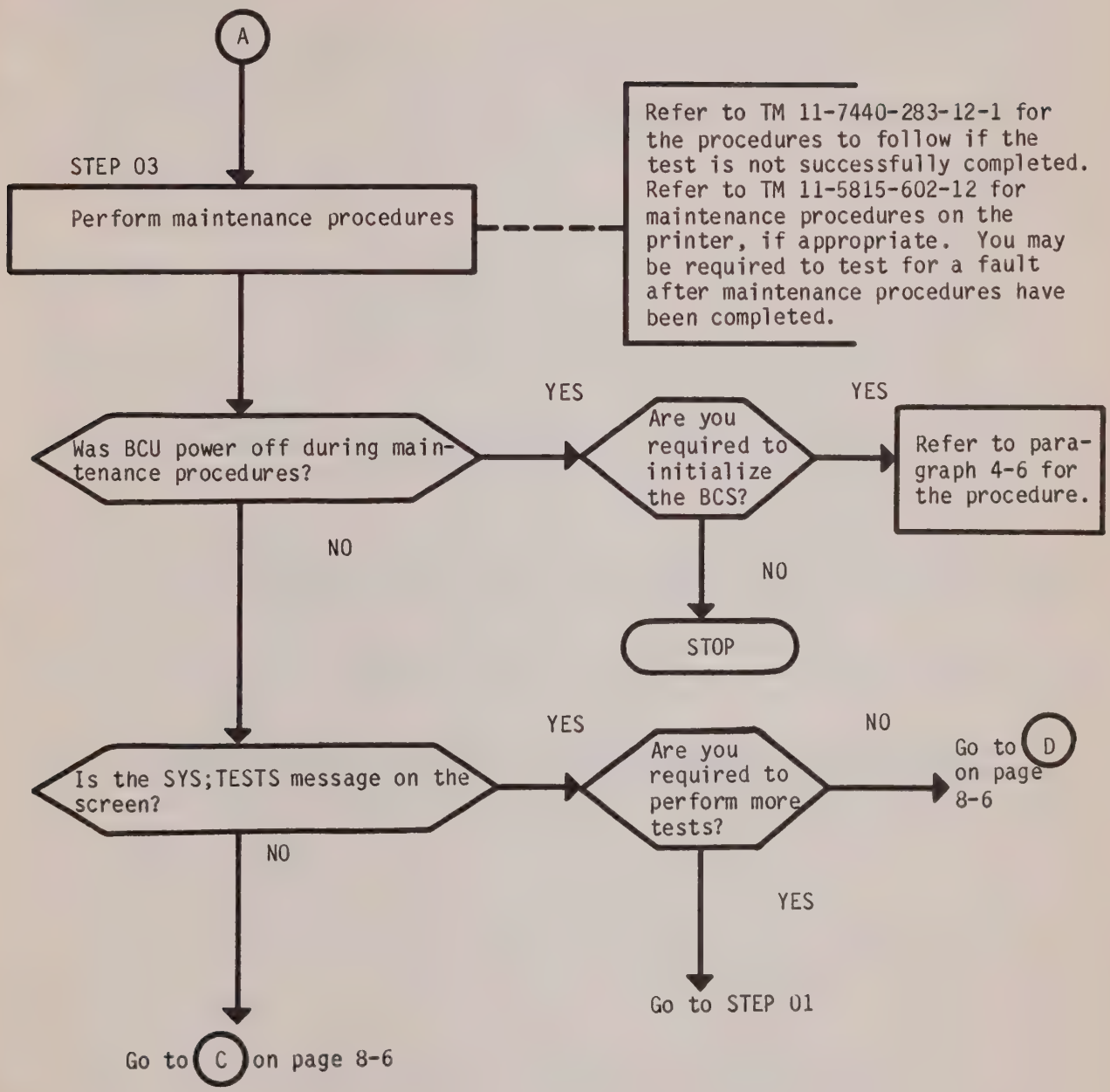


8-3. PERFORMING DIAGNOSTIC TESTS - CONTINUED


Continued from previous page
STEP 04
Enter 7 into SELECT field of SYS;TESTS message. Press EXEC key.
C
SYS;WEAPONS message is displayed
D
Are you required to initialize the BCS?
YES
Initialize the BCS. Refer to paragraph 4-6 for the procedure.
NO
Are you required to shut down the BCS?
YES
Shut down the BCS. Refer to paragraph 4-7 for the procedure.
NO
STOP

8-3. PERFORMING DIAGNOSTIC TESTS - CONTINUED

Continued from previous page


A
STEP 03
Perform maintenance procedures
Refer to TM 11-7440-283-12-1 for the procedures to follow if the test is not successfully completed. Refer to TM 11-5815-602-12 for maintenance procedures on the printer, if appropriate. You may be required to test for a fault after maintenance procedures have been completed.
Was BCU power off during maintenance procedures?
YES
Are you required to initialize the BCS?
YES
Refer to paragraph 4-6 for the procedure.
NO
NO
STOP
Is the SYS;TESTS message on the screen?
YES
Are you required to perform more tests?
NO
Go to D on page 8-6
NO
YES
Go to STEP 01
Go to C on page 8-6

Section III. SYSTEM DIAGNOSTIC TESTS INDEX MESSAGE FORMAT

SECTION CONTENTS	PARA	PAGE
SYSTEM DIAGNOSTIC TESTS INDEX MESSAGE (SYS;TESTS)	8-4	8-8

8-4. SYSTEM DIAGNOSTIC TESTS INDEX MESSAGE (SYS;TESTS)

a. Purpose. The SYS;TESTS message is used to perform operator-generated diagnostic tests on the BCS.

b. Source. The SYS;TESTS message is displayed:

- during initial load before the SYS;WEAPONS message
- when the EXEC key is pressed following the completion of any single diagnostic test listed in the SYS;TESTS message.

c. Input. The SYS;TESTS message is displayed with a 7 (EXIT DIAGNOSTICS) in the SELECT field. If you wish to exit, press the EXEC key. Otherwise, enter the index number corresponding to the test that you wish to perform into the SELECT field of the SYS;TESTS message. Press the EXEC key.

d. Computer Processing. Pressing the EXEC key causes the BCS to exit diagnostics or perform the selected test based upon the entry in the SELECT field. Refer to section III of this chapter for a detailed discussion of the tests.

e. Output. The SYS;WEAPONS message is displayed when 7 (EXIT DIAGNOSTICS) has been selected. Test page(s) are displayed for each option selected. Refer to section IV of this chapter for a detailed discussion of these test pages.

f. Message Format and Legal Entries. The following SYS;TESTS message is shown as it appears on the lower display of the BCU. Each mnemonic used in this message is explained. The values displayed and the legal entries are provided.

8-4. SYSTEM DIAGNOSTIC TESTS INDEX MESSAGE (SYS;TESTS) - CONTINUED

```
SYS;TESTS;C:___;
  1:DISPLAY TEST
  2:KEYBOARD TEST
  3:PRINTER TEST
  4:COMMUNICATION CHANNELS TEST
  5:GDU CHANNEL TEST
  6:FRONT PANEL TEST
  7:EXIT DIAGNOSTICS
  8:RUN 1-7


SELECT:__;
```

| SYS;TESTS; | C:___;

SYS;TESTS identifies the message as the system diagnostic tests index message.

SYS;TESTS; | C:___; |

C indicates the message classification. This is an optional entry. Legal entries are listed in appendix H.

| 1:DISPLAY TEST |

1:DISPLAY TEST indicates the plasma display diagnostic test routine.

| 2:KEYBOARD TEST |

2:KEYBOARD TEST indicates the keyboard diagnostic test routine.

| 3:PRINTER TEST |

3:PRINTER TEST indicates the printer diagnostic test routine.

8-4. SYSTEM DIAGNOSTIC TESTS INDEX MESSAGE (SYS;TESTS) - CONTINUED

4:COMMUNICATION CHANNELS TEST

4:COMMUNICATION CHANNELS TEST indicates the communication channels diagnostic test routine.

5:GDU CHANNEL TEST

5:GDU CHANNEL TEST indicates the GDU channel diagnostic test routine.

6:FRONT PANEL TEST

6:FRONT PANEL TEST indicates the front panel diagnostic test routine.

7:EXIT DIAGNOSTICS

7:EXIT DIAGNOSTICS is the entry for exiting the diagnostic test routine. The SYS;TESTS message will be displayed with a 7 in the SELECT field upon initial load. The SYS;WEAPONS message will be displayed upon execution of the SYS;TESTS message when 7 is entered into the SELECT field.

8:RUN 1-7

8:RUN 1-7 is the entry for running all diagnostic tests (1 to 6) and then exiting diagnostics.

SELECT:__;

SELECT allows you to select the diagnostic test routine you want to run. This is a required entry. Legal entries are 1 to 8.

Default = 7

g. Exploded View. Not applicable.

Section IV. DIAGNOSTIC TEST PAGES

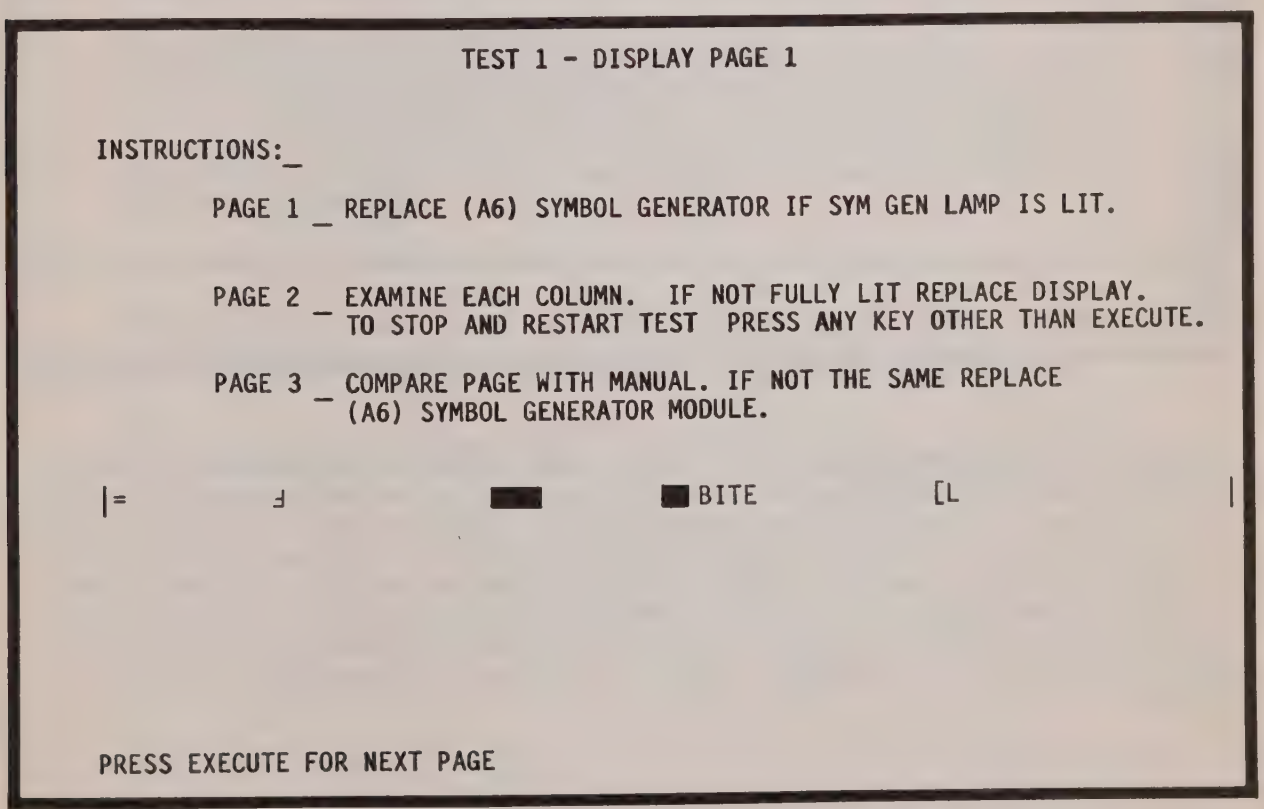
SECTION CONTENTS	PARA	PAGE
PURPOSE OF TEST PAGES	8-5	8-11
TEST PAGES DISPLAYED FOR OPERATOR ACTION DURING DIAGNOSTIC TESTS	8-6	8-11

8-5. PURPOSE OF TEST PAGES

The pages displayed during the diagnostic tests provide you with all the information you need to complete the tests. These pages are displayed automatically and in sequence. Follow the instructions on each page as explained in paragraph 8-6 below.

8-6. TEST PAGES DISPLAYED FOR OPERATOR ACTION DURING DIAGNOSTIC TESTS

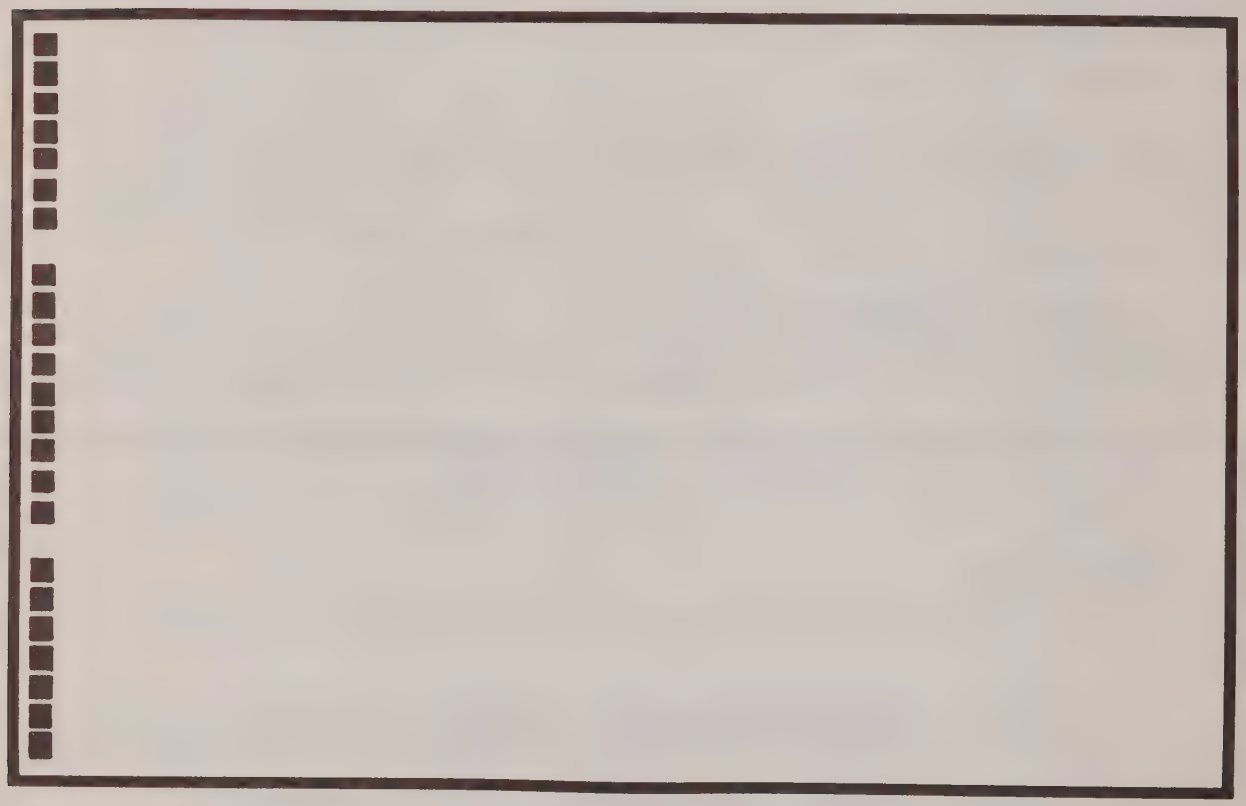
a. DISPLAY TEST Diagnostic. When you enter the number 1 into the SELECT field of the SYS;TESTS message and press the EXEC key, the diagnostic test routine that checks the display on the BCU will begin. Three pages of information will be displayed in sequence for your action during the test. The first page is shown below.


TEST 1 - DISPLAY PAGE 1
INSTRUCTIONS:_
PAGE 1 _ REPLACE (A6) SYMBOL GENERATOR IF SYM GEN LAMP IS LIT.
PAGE 2 _ EXAMINE EACH COLUMN. IF NOT FULLY LIT REPLACE DISPLAY.
TO STOP AND RESTART TEST PRESS ANY KEY OTHER THAN EXECUTE.
PAGE 3 _ COMPARE PAGE WITH MANUAL. IF NOT THE SAME REPLACE
(A6) SYMBOL GENERATOR MODULE.
BITE
PRESS EXECUTE FOR NEXT PAGE

8-6. TEST PAGES DISPLAYED FOR OPERATOR ACTION DURING DIAGNOSTIC TESTS - CONTINUED

(1) Page one tells you to check the SYM GEN lamp. If the lamp is lit, replace the (A6) SYMBOL GENERATOR. Refer to TM 11-7440-283-12-1 to replace the symbol generator module.

(2) Press EXEC to go to page two. Page two is shown below.



Page two checks the light intensity of the plasma display. Each of the 72 columns of the display is checked one column at a time. If you desire to examine any of the lighted columns more closely, press any key except EXEC and wait for the column to stop. The lighted column will remain in place. When you are ready for the column to continue moving across the display, press any key except EXEC. If any column is not fully illuminated, refer to TM 11-7440-283-12-1 to replace the plasma display. When the lighted column has appeared in all 72 columns and you are satisfied that each column is fully illuminated, press the EXEC key and page three will be displayed.

8-6. TEST PAGES DISPLAYED FOR OPERATOR ACTION DURING DIAGNOSTIC TESTS - CONTINUED

(3) Page three is shown below.

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^_ABCDEFGH
HABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^_ABCDEFG
GHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^_ABCDEF
FGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^_ABCDE
EFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^_ABCD
DEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^_ABC
CDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^_AB

BCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^_A
ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^_
_ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^
^_ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]
]^_ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\
\]^_ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[
[\]^_ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?
?[\]^_ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>
>?[\]^_ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=

=>?[\]^_ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<
<=>?[\]^_ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;
;<=>?[\]^_ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:
:;<=>?[\]^_ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./
/:;<=>?[\]^_ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-.
./:;<=>?[\]^_ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-
PRESS EXECUTE FOR INDEX
```

(4) Compare the page on the lower display with the page shown above. If there are any differences, refer to TM 11-7440-283-12-1 and replace the plasma display.

(5) If you have completed all actions required by pages 1 through 3 of the DISPLAY TEST diagnostic, return to STEP 03 on page 8-4 of the flowchart at paragraph 8-3.

8-6. TEST PAGES DISPLAYED FOR OPERATOR ACTION DURING DIAGNOSTIC TESTS - CONTINUED

b. KEYBOARD TEST Diagnostic. When you enter the number 2 into the SELECT field of the SYS;TESTS message and press the EXEC key, the diagnostic test routine that checks the keyboard on the BCU will begin. The following page will be displayed for operator action.

```
                        TEST 2 - KEYBOARD

PRESS EACH KEY ON KEYBOARD. OBSERVE CORRESPONDING CHARACTER DISPLAYED AT
BOTTOM AND ERASED FROM CENTER. IF NOT PRESS PANEL TEST. IF THE SYM GEN
LAMP REMAINS LIT REPLACE (A6) SYMBOL GENERATOR OTHERWISE REPLACE KEYBOARD
XMIT      PRINT   DELETE    CHCK FRE   FPF    FIRE    INDEX     ALARM

POLL GNS  SAVE    CLEAR     CNCL CHF                  CUR MSN   RCVD MSG

                            @ # $ % + - & * = "
                            ] ' ! - / [ > ( < )                 1 2 3

CHAR DEL  CRSR UP CHAR INS  Q W E R T Y U I O P                 4 5 6
                                                  ^
CRSR LFT  HOME    CRSR RHT  A S D F G H J K L ,     CRG RET     7 8 9

                                          \ ?
PREV SEG  CRSR DN NXT SEG   Z X C V B N M : ; .                   Ø

          TAB     ACK       ERASE   SPACE     NAK     LNE FEED  EOT

EXEC      [THIS KEY SHALL TERMINATE THE TEST]

CHARACTER PRESSED :-
```

Follow the instructions listed on the displayed page to complete the KEYBOARD diagnostic test. When you press each key on the keyboard, you should observe that the character represented by that key will disappear from its place on the display and appear at the bottom of the display following the words CHARACTER PRESSED :-. If this does not happen, press the PANEL TEST button. If the SYM GEN lamp lights, refer to TM 11-7440-283-12-1 to replace the module. If the SYM GEN lamp does not light, refer to TM 11-7440-283-12-1 to replace the keyboard. When you have completed all actions required, return to STEP 03 on page 8-4 of the flowchart at paragraph 8-3.

8-6. TEST PAGES DISPLAYED FOR OPERATOR ACTION DURING DIAGNOSTIC TESTS - CONTINUED

c. PRINTER TEST Diagnostic. When you enter the number 3 into the SELECT field of the SYS;TEST message and press the EXEC key, the diagnostic test routine that checks the printer will begin. If you press the PRINT key and a printer is not on line, BCS will ignore the command. The following page will be displayed for operator action.

```
                    TEST 3 -PRINTER

INSTRUCTIONS :_

    PERFORM PRINTER SELF-TEST BY TURNING PRINTER POWER OFF THEN ON.
    IF TEST IS GOOD, PRESS PRINT AND COMPARE DISPLAY TO PRINTED PAGE.

    IF COMPARISON FAILS REPLACE (A7)INTFC DATA CONT NO. 2.

ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^_ABCDEFGH
HABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^_ABCDEFG
GHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^_ABCDEF
FGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^_ABCDE
EFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^_ABCD
DEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^_ABC
CDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^_AB

BCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^_A
ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^
_ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]^
^_ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\]
]^_ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[\
\]^_ABCDEFGHABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890 @!"#$%&'()*+,-./:;<=>?[
PRESS EXECUTE FOR INDEX
```

Compare the page printed out on the printer with the page shown above. Follow the instructions at the top of the displayed page to complete the test. If it is necessary to perform the self-test on the printer, refer to chapter 3 of TM 11-5815-602-12. When you have completed all actions required, return to STEP 03 on page 8-4 of the flowchart at paragraph 8-3.

8-6. TEST PAGES DISPLAYED FOR OPERATOR ACTION DURING DIAGNOSTIC TESTS - CONTINUED

d. COMMUNICATION CHANNELS TEST Diagnostic. When you enter the number 4 into the SELECT field of the SYS;TESTS message and press the EXEC key, the diagnostic test routine that checks the communication channels will begin. The following page will be displayed for operator action.

```
                    TEST 4 -COMMUNICATION CHANNELS

INSTRUCTIONS :_

        LOOP CHANNEL 1 TO CHANNEL 2 WIRE, THEN PRESS XMIT KEY AND WAIT
FOR RESULTS TO BE DISPLAYED BELOW.


   (A1Ø) COMM INTFC: TX  - WAIT
   (A1Ø) COMM INTFC: RX  - WAIT
   (A11) COMM MODEM      - WAIT

   (A12) COMM INTFC: TX  - WAIT
   (A12) COMM INTFC: RX  - WAIT
   (A13) COMM MODEM      - WAIT




PRESS EXECUTE FOR INDEX
```

Refer to TM 11-7440-283-12-1 for instructions to loop channel 1 wire to channel 2 wire. As each comm channel for MODEM 1 and MODEM 2 is checked, the word WAIT will be deleted. It will be replaced with the word PASS or the words FAULTY - REPLACE MODULE. If any line on the page shows the words FAULTY - REPLACE MODULE, refer to TM 11-7440-283-12-1 for procedures to be followed to correct the fault. If all lines show the word PASS, return to STEP 03 on page 8-4 of the flowchart at paragraph 8-3.

8-6. TEST PAGES DISPLAYED FOR OPERATOR ACTION DURING DIAGNOSTIC TESTS - CONTINUED

e. GDU CHANNEL TEST Diagnostic. When the HIP weapon model is loaded, the GDU channel is not used. When you enter the number 5 into the SELECT field of the SYS;TESTS message and press the EXEC key, the diagnostic test routine that checks the GDU channel interface will begin. The following page will be displayed for operator action.

```
                    TEST 5 -GDU

INSTRUCTIONS :_

        GDU INTERFACE PASSED




PRESS EXECUTE FOR INDEX
```

If the GDU channel interface diagnostic test is successful, the display will be as shown above. If the test is unsuccessful, the word PASSED will be replaced by the word FAILED. Refer to TM 11-7440-283-12-1 for procedures to be followed to correct the fault. If the lower display shows PASSED, return to STEP 03 on page 8-4 of the flowchart at paragraph 8-3.

8-6. TEST PAGES DISPLAYED FOR OPERATOR ACTION DURING DIAGNOSTIC TESTS - CONTINUED

f. FRONT PANEL TEST Diagnostic. When you enter the number 6 into the SELECT field of the SYS;TESTS message and press the EXEC key, the diagnostic test routine that checks the front panel will begin. The following two pages will be displayed for operator action.

```
                    TEST 6 -FRONT PANEL PAGE 1

INSTRUCTIONS :_

        PRESS PANEL TEST BUTTON.  IF ALL LAMPS, INCLUDING RCVD MSG
        LAMP ON FRONT COVER, ARE ON, PRESS EXECUTE.

        IF A SINGLE LAMP IS NOT ON, REPLACE CONTROL PANEL.
        OTHERWISE REPLACE (A9) GDU INTERFACE.




PRESS EXECUTE FOR NEXT PAGE
```

Follow the instructions listed on this page. Line 4 of the above display means that if more than one lamp is not on, replace the GDU interface module in accordance with TM 11-7440-283-12-1. When completed, press the EXEC key to display the second page of the test. The second page is shown on the following page.

8-6. TEST PAGES DISPLAYED FOR OPERATOR ACTION DURING DIAGNOSTIC TESTS - CONTINUED

INSTRUCTIONS :_

IF ANY OF THE FOLLOWING LAMPS ARE NOT ON, OR THE ALARM DID NOT SOUND, REPLACE (A9) GDU INTERFACE.

PLU-EU	PLU-TU	IDC 2	SYM GEN
MEM CLR	CHK FIRE	FIRE MSN	MSG RCVD
COMM CH1	COMM CH2	BOTH LAMPS FLASHING	

PRESS EXECUTE FOR INDEX

Follow the instructions listed on the second page to complete the FRONT PANEL diagnostic test. When you have completed all instructions required by both pages, return to STEP 03 on page 8-4 of the flowchart at paragraph 8-3.

g. EXIT DIAGNOSTICS. The BCS will automatically enter this in the SELECT field of the SYS;TESTS message upon initial load. If you do not wish to perform diagnostics, press the EXEC key. The SYS;WEAPONS message is displayed. You may enter the number 7 and press the EXEC key during diagnostic tests to exit diagnostics and display the SYS;WEAPONS message.

h. RUN 1-7 Diagnostic. When you enter the number 8 into the SELECT field of the SYS;TESTS message and press the EXEC key, the complete series of tests listed above will be run, one following the other. Follow the operator instructions listed above for each test. When the last test (FRONT PANEL TEST) is successfully completed, the computer will exit the diagnostic function and display the SYS;WEAPONS message.

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3-10	3-3		3-1
5-6	5-8		
		F03	

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

Recommend that the installation antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°.

REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2° without degradation of operation.

Item 5, Function column. Change "2 db" to "3db."

REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.

Add new step f.1 to read, "Replace cover plate removed in step e.1, above."

REASON: To replace the cover plate.

Zone C 3. On J1-2, change "+24 VDC to "+5 VDC."

REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

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PIN: 044830-000